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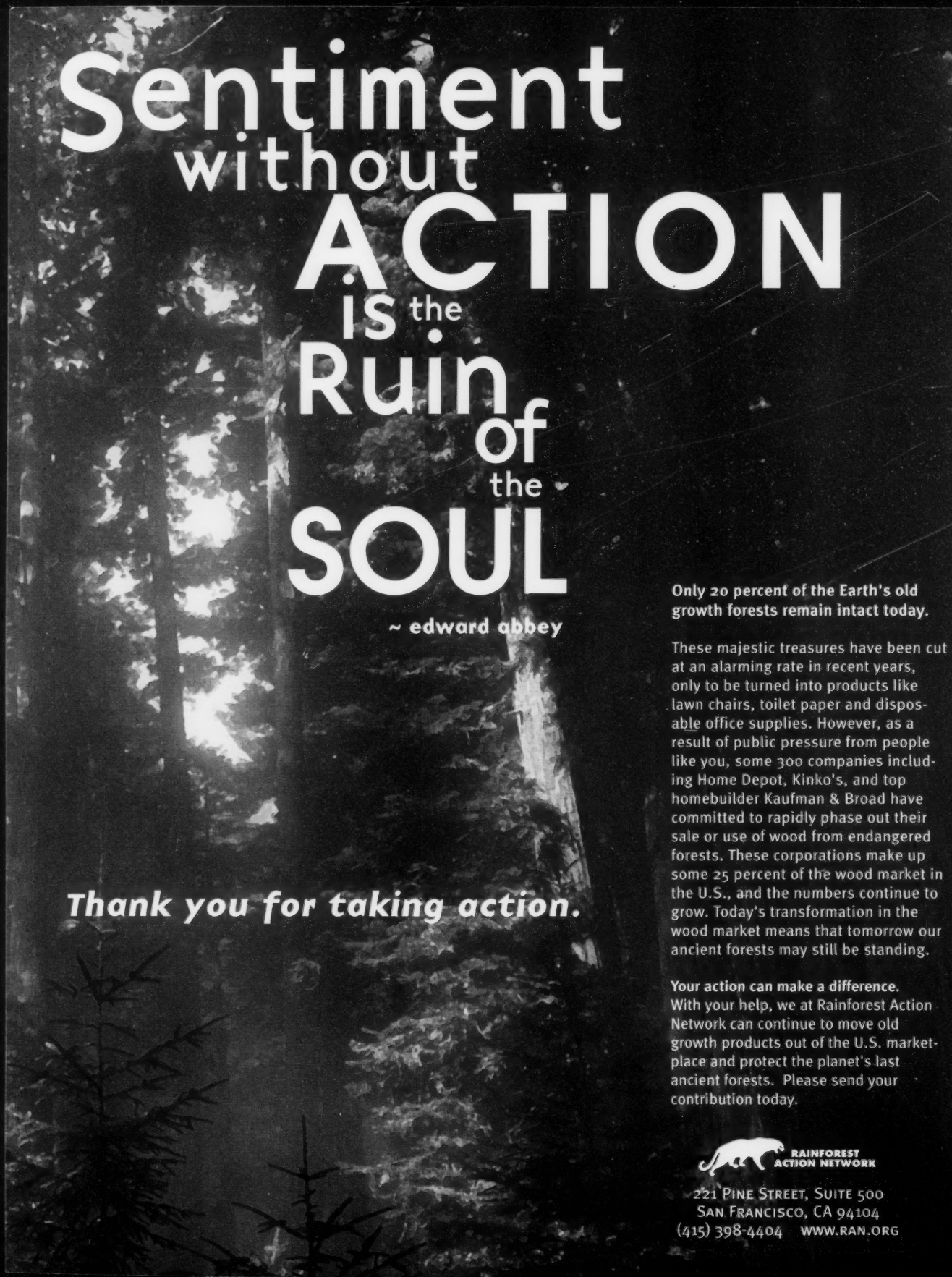

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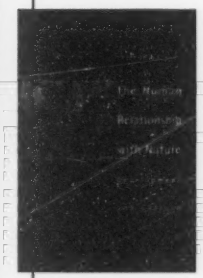

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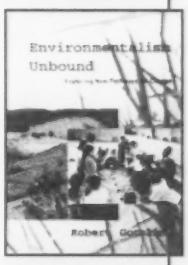

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VIRIDIANS INVADE WHOLE EARTH, SEIZE MEANS OF INFORMATION

BY BRUCE STERLING, VIRIDIAN POPE*EMPEROR

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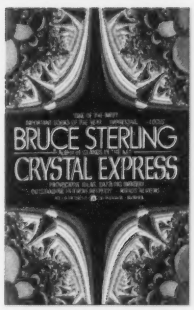

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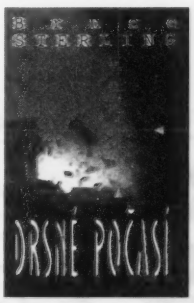

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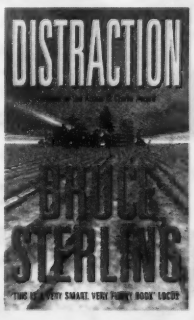

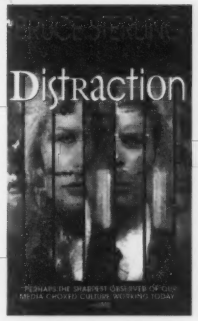

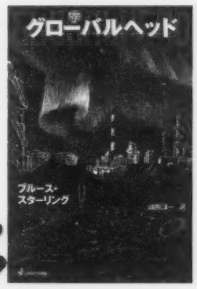

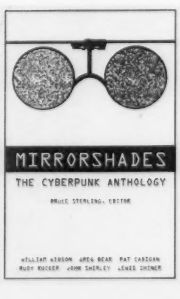

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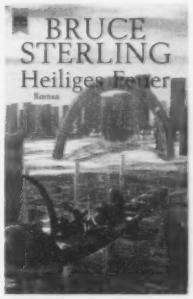

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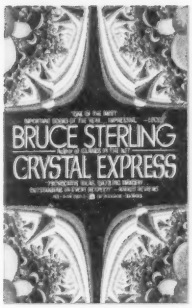

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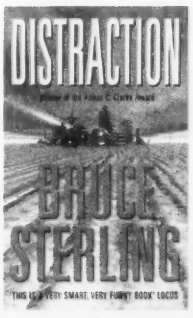

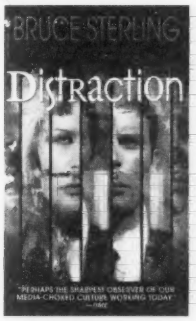

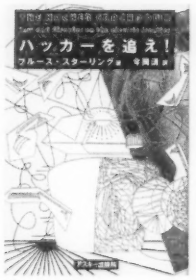

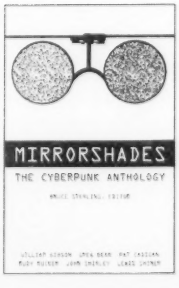

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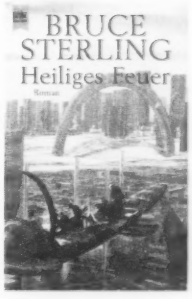
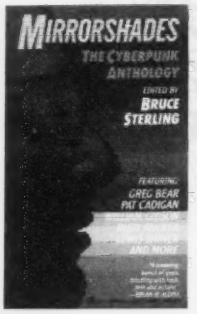
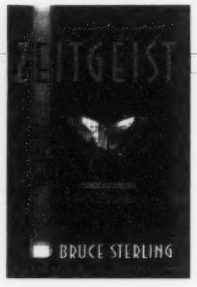
Our Guest Art Director Dave Nalle lives down the road from the Guest Editor in glamorous Manor, Texas. Though he teaches history and practices cowboy "action shooting," Dave's also my favorite font designer. (www.ragnarokpress.com/scriptorium) Dave's stock-in-trade at Scriptorium is to unearth antique hand lettering, then upgrade it for convenient use by twenty-first century mouse-jockeys. And we Viridians are, like, totally down with that. "Make it rot, Dave," I urged him feverishly as we conspired over a coffee table, licking our fingers and paging through an inoffensive issue of *Whole Earth*. "Punch holes in it! I want to see bookworms eating the margins! I want to see the past and the future, the digital and the handmade, colliding in rapture!" Most of the fonts in this issue are Dave's, and the graphic images, unless otherwise credited, are mostly from the Scriptorium collection.







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So have a nice long look. Thanks for your attention. See you on the wires.

bruces@well.com

INTRODUCING BRUCE
by Peter Warshall

We continue *Whole Earth's* attempt to avoid single-mind journalism ("editorial policy") and to blow minds with diversity. Bruce Sterling, described by the best historian and critic of sci fi, John Clute, as a brilliant endomorph bull, is equally a surrealist techno-historian, a maverick Lone Star postmodern teller of tall tales, a high-octane devourer and colorcaster for chakra-tic info on climate change, a carny of cyborgian arts and literature, and a wildcat gusher of books and novels (fourteen so far). *Distraction*, for instance, was given endless gold stars by John Clute, and many benedictions by Stewart Brand.

He's described the Internet as a vanity press and said of *Whole Earth*: "the greatest countercultural periodical in the history of humankind. Give them your money, donate your blood, if you have to." Hard not to offer him an issue, though he rankles neo-Luddites by portraying technology not as evil, but as mock hero—and those who screw with the mock hero, he loves even more (see *Hacker Crackdown: Law and Disorder on the Electronic Frontier*, or *Mirrorshades: The Cyberpunk Anthology*, or just read *Holy Fire* or *Distraction*). I recently heard Bruce describe a fiber-optic toothbrush that would display your good and bad dental bacteria on a screen while you brushed, and an emerald-foam toothpaste with only good bacteria to be pleasantly swirled like wine. The audience wasn't sure if the toothbrush was imaginative or available at Walgreens. Perfect Bruce; they laughed nervously. He has mastered splicing the old economy with futuristic madness. At the moment. Bruce chortles the Net as "emerging social glue" and commandeers the Viridian Movement (flashier than the greens, more intent on infiltrating households to reduce Greenhouse gassing).

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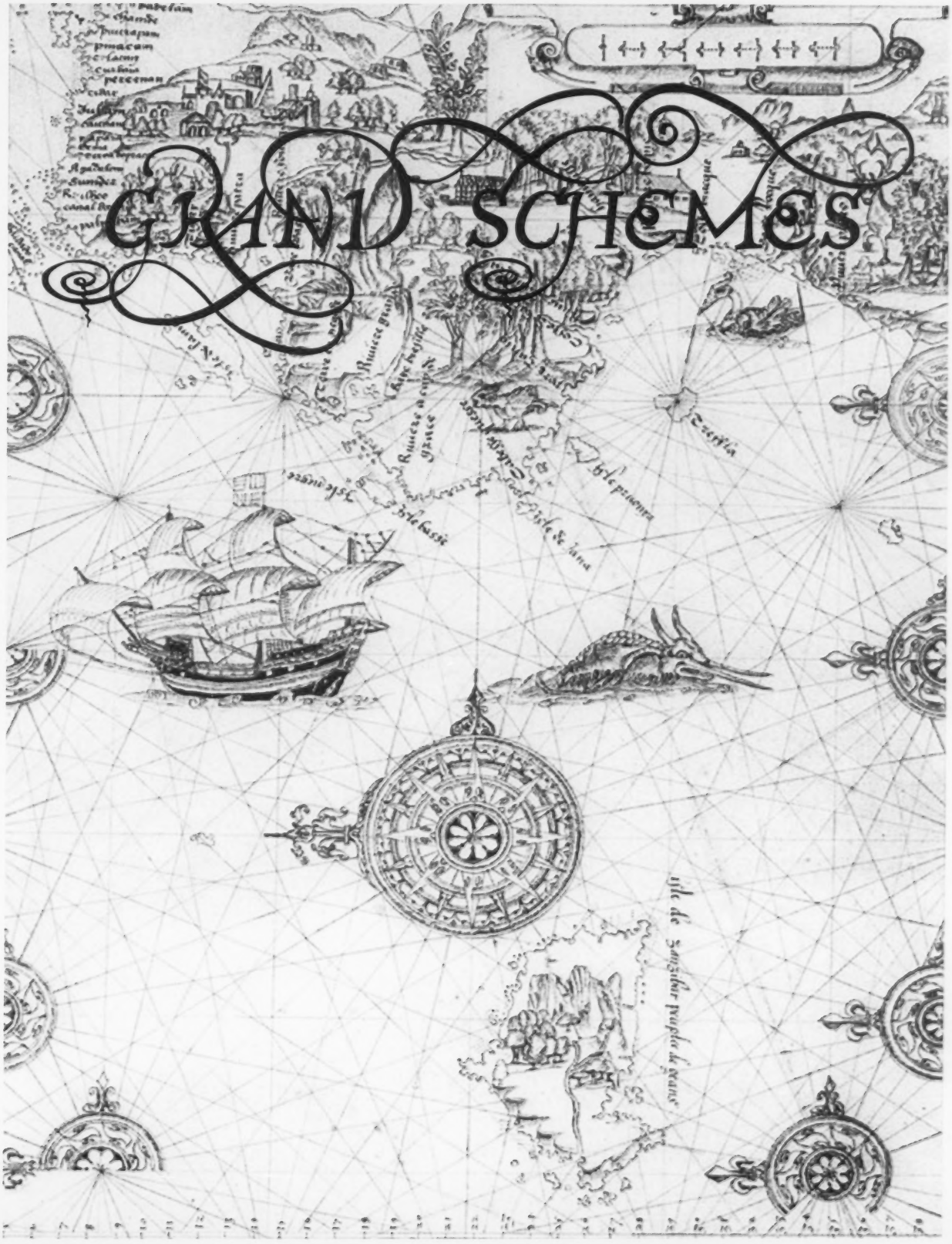
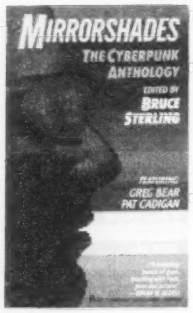

GRAND SCHEMES



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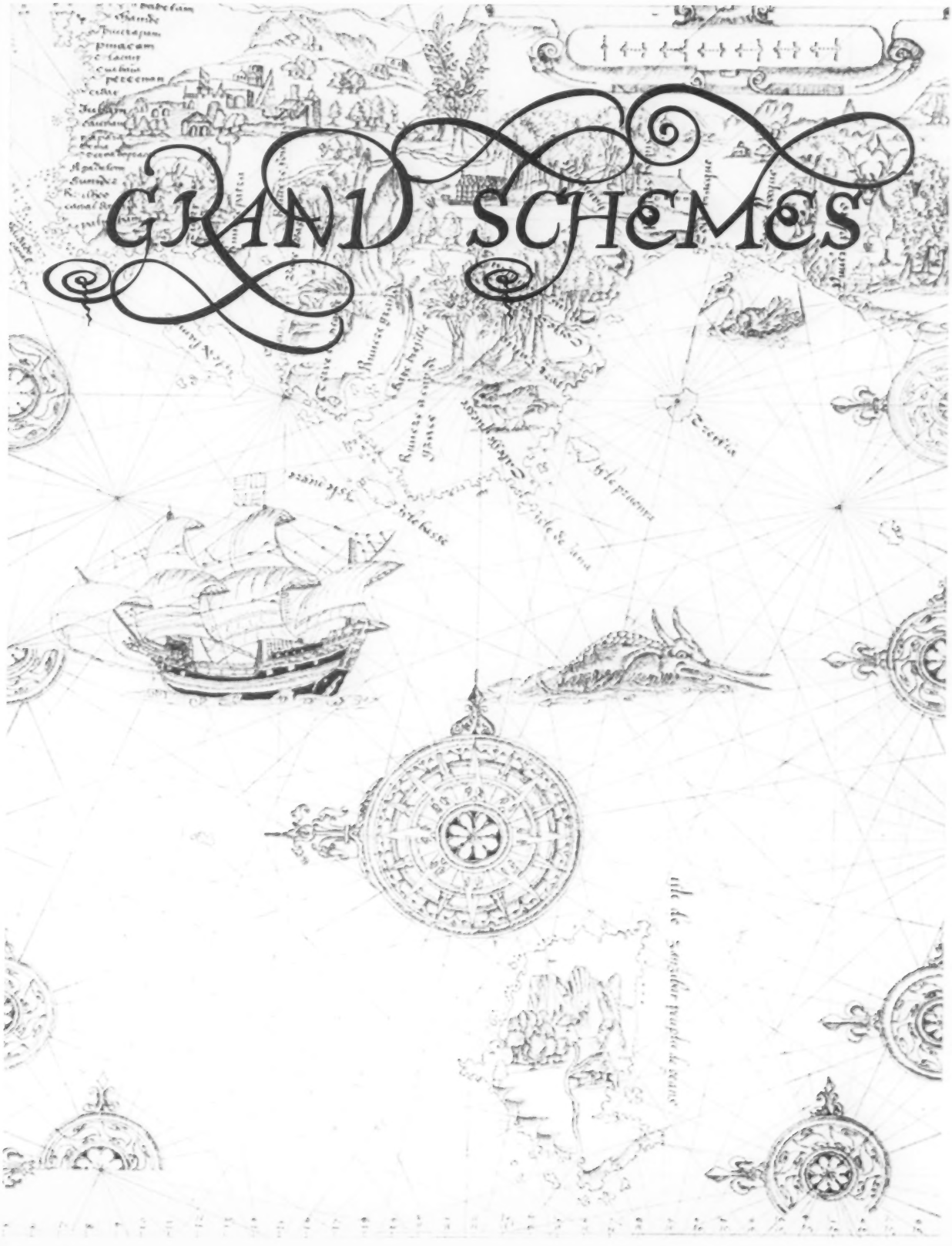


A Bug Story

By Alan AtKisson

Alan AtKisson is president of AtKisson, Inc. (www.AtKisson.com) and director of arts & culture for the Sustainability Institute.

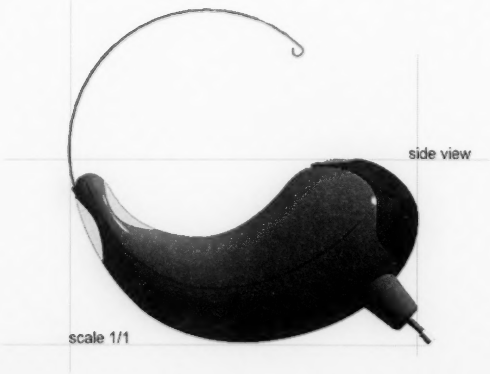
It began, as so many things begin these days, with an email message.

The message came from Bruce Sterling, famed science fiction author and self-proclaimed "Pope-Emperor of the Viridian Movement"—a design movement to make the products and graphics we are surrounded by both greener and cooler. "Viridian" literally means a "cool shade of green." Sterling had called the Viridian Movement into being from the comfort of his Austin, Texas, computer den, by means of that already-antiquated but still-subversive twentieth-century technology, the email listserv.

Sterling took a bright idea by listserv member Stefan Jones, and wrote some ad copy for a product that did not yet exist:

One of the most offensive artifacts of the twentieth century is the standard household energy meter. This ugly gizmo clings like a barnacle to the outside of your home, readable only by functionaries. Clumsily painted in battleship gray, this network spy device features creepy, illegible little clock-dials, under an ungainly glass dome. Look a bit closer, and this user-hostile interface deliberately insults you, with a hateful anti-theft warning, and a foul little lockbox.

This crass device is designed to leave you in stellar ignorance of your own energy usage. It publicly brands you as a helpless peon, a technically illiterate



source of cash for remote, uncaring utility lords.

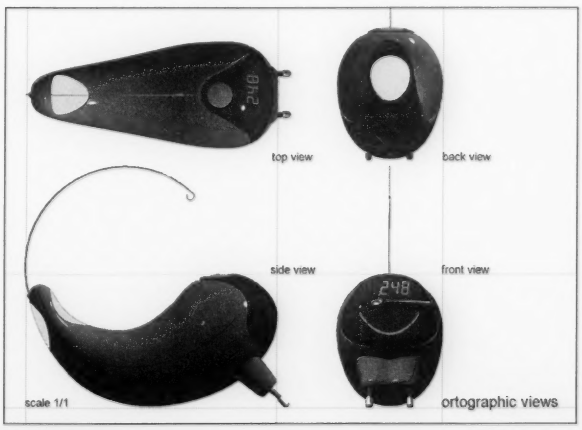
But today, thanks to the Viridian Electrical Meter, the tables are turned. The Viridian Meter is not some utility spy device, but a user-owned art object!

Circulated around the world by viral email forwarding, this Viridian vision of a household electricity meter that is actually beautiful, engaging, and easy to understand was well received. You could say that people were, uh, electrified by the idea of utility customers all over world cutting back on power (and global warming) because of their new meter's sensual and aesthetic reward signals.

"Let's make this idea real," said Michael Lerner of the Jennifer Altman Foundation. "Okay," said I, foolishly volunteering to coordinate a global design competition. The Sustainability Institute in Vermont, where I volunteer (from on the road) as the "director of arts & culture," sponsored the yearlong venture.

With $8,000 in prize money, the "First International Viridian Design Competition" attracted around thirty-five serious applicants to the first round, from as far away as Turkey and Pakistan. Participants ranged from university students to a surprising number of professional design firms. Some had already designed meters, and were happy to have a contest to enter.

First they submitted one-page descriptions of their design ideas, plus pictures. An esteemed panel of judges—including sustainability, energy, and design luminaries such as Amory Lovins, John Todd, Nancy Jack Todd, and Donella Meadows—made the first cut. Ten finalists were invited to submit prototypes (either physical or virtual). Donella Meadows carted these prototypes to the annual meeting of an international sustainability network called the Balaton Group (named for Hungary's largest lake, where the group meets).



The Wattbug

Forty-plus Balaton participants from more than a dozen nations reviewed an amazing assortment of plastic models, posters, videotapes, and CD-ROM computer animations. Every member voted by deciding how much of the $8,000 each finalist deserved.

The Resounding Winner: The Wattbug

This little device, designed by a Turkish team headed by Inci Mutlu, was purely virtual—a computer animation, backed up by detailed engineering diagrams. Mutlu had made her meter into a friendly little creature with a glowing tail (red, yellow, or green, depending on your current energy consumption) and an expressive face (purrs and smiles for low-consumption green, squeaks and frowns for high-consumption red). The "eyes" were LED readouts in either kilowatt-hours or the amount of actual money you are currently throwing out the window.

There were some excellent runners-up—all rewarded with a few hundred dollars and publicity—but the Wattbug was truly amazing. A star was born.

Sterling, others, and I cranked up the old listservs. Word about the Wattbug spread like,

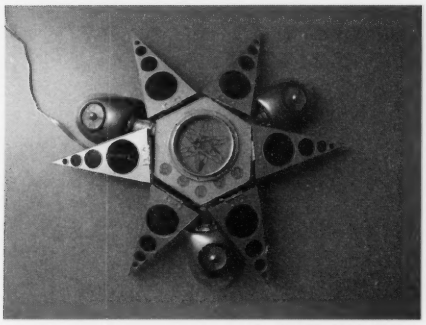
well, viral email. Eventually, nice pictures and write-ups began finding their way into prominent places like *Wired* magazine and (with some PR help from Washington consultant Henry Griggs) *The New York Times*. Companies came forward ready to help build the Wattbug's innards, or to market the final product. The timing (California's energy crisis) could not have been better. People have begun to clamor, in a small way, for real Wattbugs.

And that's where the story...stops. For the moment.

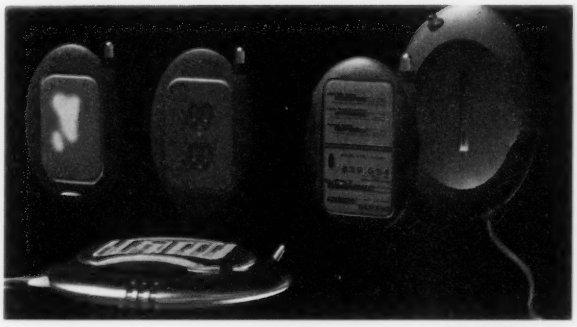
Despite this star on stage, this upsurge of demand, this great timing, the Wattbug is still living only in the ecosystem where it evolved: the world of virtual ideas. The Wattbug remains "Viridian" in the truest sense, as it is still "a very cool product that does not yet exist, but that everybody would want." Turning good ideas into real products is a complicated process.

But stay tuned: emails are flying, meetings are occurring, plans are afoot. And if all goes well, you will soon be able to have your very own Wattbug, translating radio signals from your traditional meter into lovely and useful information, squeaking at you to replace those power-hog appliances, and smiling and purring to you when you get romantic... by candlelight.

For more information about the Wattbug, visit the Sustainability Institute website at www.sustainer.org.

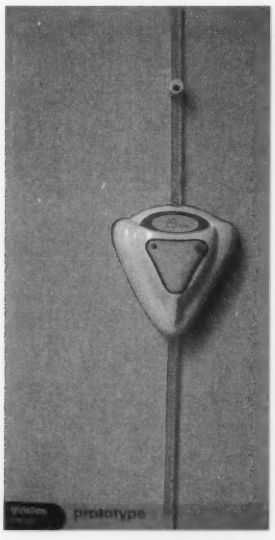


The Prescott Meter



The Trifiliometer

The Thompson Meter



The Schmidt Meter

Believing Cassandra
An Optimist Looks at a Pessimist's World
Alan AtKisson
1999; 236 pages
$16.95
Chelsea Green

A FUTUREPROOFED POWER METER

A DIFFERENT SCRIPT FOR AN INFORMATION APPLIANCE

BY NATALIE JEREMIJENKO

Natalie Jeremijenko, 1999 Rockefeller fellow, is a design engineer and technoartist (see Whole Earth, Summer 2000). Her striking work has been featured in the Rotterdam Film Festival, the Guggenheim Museum, the Museum Moderne Kunst, the LUX Gallery, the Whitney Biennial, and Ars Electronica. Lately, Prof. Jeremijenko has been designing power meters, along with her associate Serge de Gheldere and student John Ferri.

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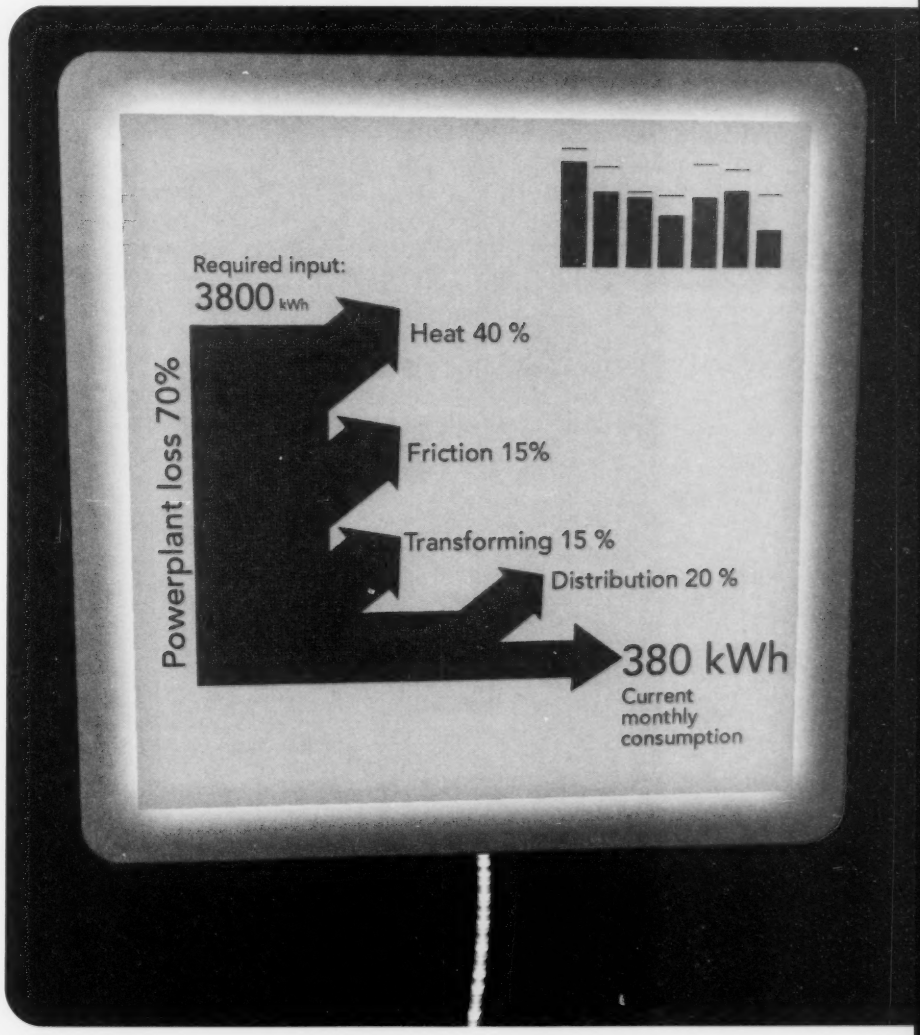
One unfortunate vision of our technological future is the "innovation imperative," which strongly implies that our things and appliances must always get "smarter." I am working together with Serge de Gheldere of the European design firm Futureproof/ed, to create a new domestic power meter that breaks that old cliché. Our proposed power meter is accurate, high-tech, and digital, yet as dumb as a brick.

You, the user, are the ultimate source of intelligence and value judgements here. This appliance responds to human language, yet is not itself "smart." Although it can talk to you and also listen and take action, it fails the Turing Test spectacularly. There's no pretense that you're addressing some Artificial Intelligence inside our power meter. You give the meter your words, and it reacts by a predesigned script. Its interaction is limited to data that you, the user, might actually want to



know, practically and immediately, from a power meter.

The display of this device is entirely blank. Unlike most flashy, pushy, information appliances, it is anonymous and discreet. It doesn't explain itself or promote itself; it doesn't even offer a logo or a brand name. That's because you already know what it is for: it's your power meter. You got it, and you put it there. You don't need it to flash some display all the time, aimed at no one.

Being the human, you're the clever one in this relationship. You are the one with genuine awareness, who is making smart decisions about your energy consumption. The power meter merely does useful, dumb things that are inhumanly accurate, such as measuring your electricity consumption accurately in real time, storing the history of your energy consumption with an embedded microprocessor, and coordinating with your appliances to run them off-peak, thus saving you money.

This meter's most important relationship is not its tie-in to other household devices, but its core relationship with you, the human. When you speak up with an idea about power or meters, then it listens to you. Only then does it show a display.

In order to see the meter's display you have to speak to it—or rather, to the software speech-recognition function in its embedded chip. Even then, the meter doesn't merely blurt out a stream of data. Instead, it tests you to see if you yourself, the decision-maker, really know what is going on powerwise.

Let's say you are consuming ten kilowatts. If you say "Nine" or "Eleven," the meter will stay impassively blank. But if you say "Ten," the exact electricity consumption will then display. The meter will show you your exact current consumption rate at that moment: say, 10,768 watts. It can also show you the recent history of your usage, plotted against time, so that you can recognize your consumption patterns over a period of time and make some intelligent comparisons.

It doesn't take long to get this mechanical reward for demonstrating your intelligent human knowledge. You can get the first number right within a few seconds, even if you are utterly ignorant of the power flowing through your home. But by first demanding your best guess, this product shifts the moral and intellectual responsibility from mere electrical hardware to you, a moral actor. This, of course, is where the responsibility belongs. Only you can really know; your meter just measures and displays. And if you don't know, then the meter displays this, too.

Because people are good at learning, this device ultimately makes itself obsolete. Soon you've been trained to recognize the patterns of your power consumption, and you can set up some optimal situation (say, buying green power). Then you can pass the meter on to your benighted neighbor.

However, this simple and dumb little device could easily be elaborated, so as to draw you deeper and deeper into the hidden realities of electrical networks. Learning about your own household power consumption is just the first game. Next you can learn about power in the context of your neighborhood, and learn how your own neighborhood compares to others. You might even learn about the hidden environmental impact of every wasted kilowatt-hour. For instance: how many living trees would it take to sequester the carbon dioxide that your fossil-fueled house spews into the atmosphere?

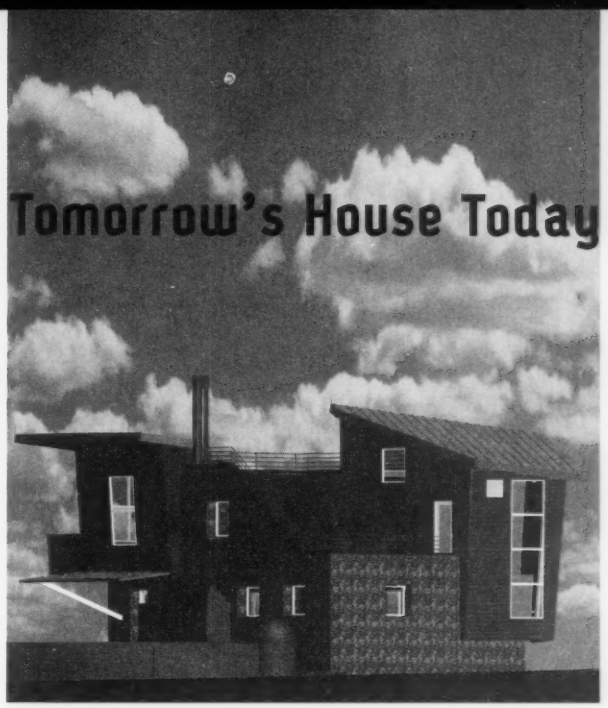
Why not extend the meter's timescale drastically? This would show the consequences of today's consumption on your grandchildren. A humble power meter then becomes an experimental feedback system for today's industrial metabolism. A meter becomes our visual monitor into the future, displaying the by-products of our actions and choices today.

With every purchasing decision, with every time we turn a light switch or a car key, we make unconscious (and possibly unwanted) choices that shape our lives. This direct relationship only seems abstract and distant because our meters are so badly designed. With a properly designed feedback loop, people can bring this abstraction into the realm of immediate awareness and action.

e-House2000

Tomorrow's House Today

by Michael McDonough



Michael McDonough is an award-winning architect and industrial designer based in New York. He designs commercial and custom residential projects, and consults worldwide on corporate futurism and product development.

The idea occurred to me about two years ago. Everything required to build a perfect vision of the future was actually available now. Anything a forward-thinking architect could imagine was invented, manufactured, packaged, searchable on the Internet, purchasable with a credit card, and shippable overnight.

The green, sustainable technologies that could make for an energy-efficient future were there: photovoltaics, thermal-solar heaters, instant hot water heaters, radiant cooling systems with geothermal links. So were the smart building controls: the software, sensors, and networking capabilities to run an entire building and its green systems. Even arcane, nearly lost products that would give character to the structure: high-efficiency fireplaces, bread ovens, real wood-siding and trim--they were there too. You could reinvent the contemporary dwelling--predict the future, as it were--with a search engine.

The problem was that all these wonderful things were unavailable in one coherent, marketable, understandable package. You might find great technologies at a dozen different sites, but the connective tissue was missing. It was as if you had stumbled across a 10,000-piece jigsaw puzzle of Van Gogh's *Wheatfield with Corn Flowers*, but the cover of the box was missing and the pieces were all over the floor. You could tell it meant something important, but it would be quite an exercise to form a clear picture.

I had seen this incoherence for decades. First, I studied and worked with environmental artists in the 1970s, and they taught me about the lyrical, image-making power of nature and built-form's response to it. They had sculpted the land, pushed objects around as if the sun or sea had moved them, and woven natural objects into their art. Forests had been restored as living monuments; recycled mine tailings and lake tides were used as sculpture; even the sky had been filled with wind-powered objects...all this while the rest of the world was dancing to disco.

Cultural heroes all, these "green artists" prided themselves on the fact that their work was too ephemeral or vast in scale to be co-opted and commodified. An unnoticed avant-garde, they demanded that nature be part of any notion of modern art, and modern life. Whether their names are known today or not, the echoes of their work are present in the energy that drives a lot of environmentalism today: nature can be the basis for the images and systems through which we define ourselves. On the other hand, their work, being unsellable, never sold. And disco probably had a more powerful lock on the popular imagination.

I also saw the same short-of-the-mark efforts of enlightened businesspersons and manufacturers throughout the 1980s and 1990s. Small companies offered amazing recycled content, energy efficiency, or nonpolluting products. Soybean wall tiles, high-strength cellular recycled paper construction panels, hemp particle board, bamboo printing paper. As often as not, these products would start in someone's garage, and be withdrawn from the market with the company in bankruptcy, just after the product literature was finally distributed.

Some large companies offered green products, but didn't market them as such, often because they believed that talking about sustainable technologies was irrelevant, and that it would have no impact on sales. I remember contacting one enlightened manufacturer about ten years ago, requesting samples of a particularly good product: fiberboard panels made without the arguably carcinogenic formaldehyde. "Oh we don't actually make that," a salesperson told me. "It's just in the catalog, but nobody buys it. It costs a dollar or two more...."

Green industries were not integrated. Their markets were fragmented. Their marketing was abysmal. Lacking demonstrated successes and established sales, their financing was made more difficult and their costs were higher. All in all, the movement had never achieved what is known in the computer industry as "confluence." In the parlance of the time, they didn't have it together.

Fast-forward to the turn of the twenty-first century and, amazingly, a lot of green technologies have somehow survived. And new ones keep popping up all the time—new concretes, recycled fabric insulations, sustainable forestry lumber, healthier paints, hydrogen-powered fuel cells, formaldehyde-free building panels (finally), and so forth.

Traditional building techniques (so-called "alternative" technologies) are now recognized as having value in terms of energy efficiency, local materials sourcing, and cultural identity. Operable windows and high-efficiency fireplaces have a place in the future, only now they are "fresh-air delivery systems" and "renewable-resource-fueled equipment."

Importantly, the "smart house" concept has provided us with sophisticated decision-making capabilities that allow the buildings themselves to act for energy efficiency.

Just type in a word or two on your laptop's search engine, and the future is there. The question is, why after all these years has no one gathered up these things and designed a house around them? A building that employs all of these products, that can achieve the elusive "confluence," embodying the passion, inventiveness, and optimism that has fueled the environmental movement for decades?

Such a building would be equal parts pragmatics and aestheticized glamour. It would learn from last thirty years. It would solve real problems: energy conservation, sick-building syndrome, resource depletion. It would reflect nature, derive its shapes from nature. The angles and torques of the building's form would actually perform a function: capture light, or view, or solar heat; or provide shade. It would embody an architect's response to nature as harvestable resource. It would celebrate health and well-being, reflecting the idea of a healthy-house, but with panache. The design would have green, high-tech, and alternative technologies all at once. It would be an e-commute/work-live/Internet-controllable/ future-oriented/upgradeable/designed-for-disassembly/think tank of a house.

Like a hand-woven carpet or patchwork quilt, even its imperfections would ennoble it. It would propose a process, open-ended and inclusive, so that if something better came along, that too could be incorporated. Even its failings would be evocative, because they would be so earnest.

"What the heck," I thought. "I know all those artists, and all those businesspersons, and I try to keep up with the new products and computer technologies. I'll give it a try." So I designed and am building a house that aspires to perfection. I call it e-House2000; "e-" for "electronic" and "e-" for "environmental"—the first such house of the new millennium.

The e-House2000 looks like no other. It is simultaneously contemporary and traditional, and designed with a bit of edgy glamour. It is green, of course. And it is controlled from the web. It was created as a website first, and is now being morphed into existence.

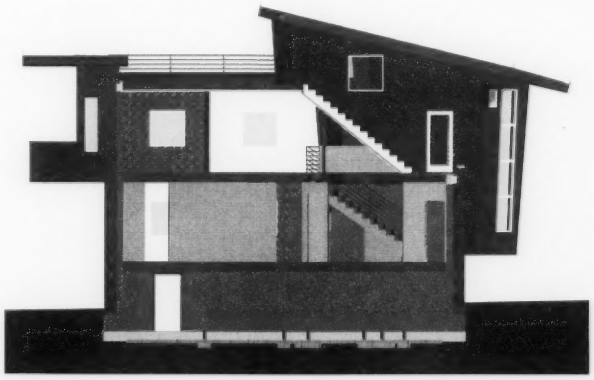
The best of sustainable technologies and the best of the Internet, it proposes a whole new building type. Sculptural in its response to nature, jammed with technology, embodying craft; it is a model for the future of housing.

The main block of the house is made of special concretes and surfaced with site-sourced stone. Big sculptural trapezoids are cantilevered off this block. One leans out to capture the best views (the "view-catcher"), another is shifted to gather the first light of day, and to provide passive solar heating (the "light-catcher"). The roof has a viewing deck and a monumental stair, recalling a beautiful house in Italy where I lived for a while and wrote my first book.

I also gathered a group of scientists, engineers, and code hackers, and we researched every house-building category we could find. From that, the website was born—a three-dimensional virtual reality rendering of the house, from digitized aerial surveys right down to the bamboo flooring and sustainable wood window trim. I then enlisted manufacturers, suppliers, and builders, and—based on the website—began the construction process.

As of this writing, e-House2000 is very close to becoming a reality in the rural woodlands of upstate New York. The recycled slag grade-beams have been formed over their rubble trench future-proofed foundations, the aerated autoclaved concrete block walls are in place, and the engineered wood I beams, formaldehyde-free building panel floors, and super-insulated structural insulated panels are on site. The e-House2000 is scheduled for completion within a year.

I have listed the ten things I could not have built e-House2000 without, and included product categories with noteworthy brand names, websites, and phone numbers in the hope that you, dear *Whole Earth* reader, might want to build (or renovate) your own perfect house, and that, in doing so, you will use the most powerful weapon available to you in influencing global resource allocation and technological deployment: your wallet.



The Ten Crucial Tools for e-House2000

1 New concrete and concrete block. New concrete products reduce the amount of ozone-depleting limestone, act as thermal insulation, breathe, take color well, and are stronger than the conventional stuff. They range from poured concrete mixes with NewCem recycled slag, to Matrix PAAC lightweight aerated autoclaved block, to flowable fills, to recycled-content parges and stuccos.

2 Computer software for design and production. The e-House2000 team used Bentley Microsystems's MicroStation/J, a cross-platform Java-compatible CAD software that takes you from concept, to design, to contract documents, to 3-D renderings, all in one program. It exports documents in numerous formats, including AutoCAD DWG files.

3 Engineered lumber products. The e-House2000 uses computer-engineered, quick growth, sustainable forest products that are cost-effective, uniform in quality, and easy to install. They include Georgia-Pacific Wood I Beams and laminated veneer lumber (LVL) girders.

4 High-performance windows. Properly manufactured high-performance doors and windows are critical for heating, air conditioning, and fuel costs. The e-House2000 uses Andersen wood doors and windows because the wood components in them are certified by the Forest Stewardship Council, and they participate in the Energy Star Program.

5 Smart house networking. Hughes Network Systems satellite Internet access provides two-way communications for web-based home controls and automation (and TV programming). This, in conjunction with X-tra Web's Home Automation products, will make e-House as efficient as a duel-fuel automobile and as personalizable as your own home page and email address.

6 Metal roofing and fiberglass-reinforced weatherproofing. Follansbee high-tech stainless steel outperforms in severe corrosive conditions and is perfect for the light- and view-catchers. Alternative-tech Revere copper offers designed-for-disassembly flexibility for roof flashing and parapets. Neither uses bituminous tars or asphalts, neither requires painting, and both age to beautiful patinas. Sarnadeck is an Energy Star waterproofing membrane that provides a recyclable content skid-resistant surface for roof deck covering.

7 Photovoltaic products. Ushering in the age of clean, green electricity, BP Solar products (in conjunction with Trace Engineering switches) offer uninterruptible power sources that protect from heavy-weather power outages and rolling brownouts while decentralizing power production, potentially making everyone an energy producer.

8 Radiant heating, cooling, and snowmelt systems. High-efficiency instant hot water heaters are tied into multi-fuel geothermal loops that fit into floors and ceilings, roofs, and roof decks. These radiant systems eliminate the need for large ducts, ensure good indoor air quality, and can be computer-controlled. E-House uses Roth's systems coupled with energy-recover ventilators, evacuated-heat-pipe solar collectors, and super dehumidifiers in a revolutionary cooling system.

9 Structural insulated panel products. Winter Panel SIPs deliver high insulation values. They can also be designed on CAD software, emailed to production plants, and computer-cut to exacting specifications and all sorts of shapes. When teamed with SmartGuard borate-preserved framing lumber and insect-resistant panel products, they point the way to the quick assembly, energy-efficient buildings of the future.

10 Valued-added thermal insulation. High-performance insulation is an integral part of building wall and roof assemblies. FOAMGLAS cellular glass offers uniquely high compressive strength and very long life span. E'NRG'Y 2 polyisocyanurate is recycled and recyclable plastic. ULTRATOUCH is made from recycled cotton jeans fibers, is fireproof, and provides thermal and acoustical insulation. LOW-E reflective insulation is nontoxic, contains post-consumer recycled material, provides a vapor barrier, and is bonded without adhesives.

e-House2000 Resources

e-House2000 on the Web
www.michaelmcdonough.com
/ehouse.htm

Malaparte
A House Like Me
Michael McDonough
1999; 200 pp.
$50
Clarkson-Potter
Essays, sketches, photos and drawings of the amazing pile built by Italian writer Curzio Malaparte. -BS

Energy-Efficient Doors and Windows

Some windows and doors are energy-efficient; some use certified woods. With this time-tested product line you get both. One stop eco-shopping with a view:

Andersen Doors and Windows
651/264-5150
www.andersenwindows.com

Wood, Wood Products, and Related Items

Lumber that is fast-growing, farmable, and never cut from a temperate rainforest (it's predictable in price, long, and strong as well):

Engineered Wood I Beams and LVLs
Georgia-Pacific Corporation
404/652-6601
www.gp.com

OK, imagine this: Some building scientists and lumber companies get together with a manufacturer that makes a naturally occurring preservative and pesticide so safe it is also the basis for a hand cleaner. Then they make a sustainable-building-technologies-style preserved lumber that requires no special handling, lasts for decades, and is available through a lumber distributor near you. Addled-headed optimism? Nope. Just the facts:

Wood Preservative/Lumber/ Lumber Products Alliance

SmartGuard(TM) Protected Building Products
www.smartguard.Ipcorp.com
/overview.asp
in alliance with:
U.S. Borax Inc.
661/287-5400
www.borax.com

Louisiana-Pacific Corporation
800/648-6893
www.Ipcorp.com

Osmose, Inc.
800/877-POLE
www.osmose.com/home.htm

Formaldehyde-free, guaranteed true and straight, made from fast-growth lumber, makes for superior strength floors and walls. One contractor I know had never tried the product; now he says he will never buy regular plywood again:

Engineered Oriented Strand Board Structural Panels
AdvanTech by Huber
Engineered Woods
800/933-9220
www.huberwood.com/products
/advantech.htm

Take a prehistoric grass that grows a meter a day, cleans the atmosphere, acts as an oxygen pump and carbon sink, is stronger than steel, and make a flooring more stable than oak from it. Oh, I almost forgot: it's gorgeous:

Rainforest Alternative Bamboo Flooring
Smith & Fong Company
650/872-1184
www.plyboo.com

Alternative-tech traditional wood siding and trim from a Vermont mill in business for about 150 years. Take your pick of colors and finish, and they factory-spray it, and give you a fifteen-year guarantee. Who knew it—parsimonious persnickety New England Yankees as culture heroes:

Prefinished 15-Year Guaranteed Vertical Grain Wood Sidings
Granville Manufacturing
802/767-4747
www.woodsiding.com

New idea for a tee shirt: Need a tropical hardwood that will last twenty years without preservatives or paint, but can't stomach the idea of taking wood from a clear-cut rainforest, and want responsibly harvested products while demanding respect for all indigenous peoples anywhere near the cutting? Me too:

Forest Stewardship Council (FSC) Certified Wood Products
EarthSource
866/549-9663 (toll free);
510/549-9663
www.earthsourcewood.com
/home.html

What if a guy struggled for years to almost single-handedly promote the bamboo plant industry, and, while lobbying successfully to change outmoded governmental regulations, learned how to grow and guarantee the plants at temperatures as low as 20 degrees below zero Fahrenheit, established a nursery that designed and sold dozens of species all over the world, then set up a way to monitor and care for them via the Internet? And then he moved to Florida....

Bamboo Plant Resources
Tornello Landscape Nursery
813/645-5445
www.tornellobamboo.com

Piece of eco-lumber here; piece of recycled steel there, improbable custom-designed 57-degree angle....gotta connect them 35 feet in the air, or the building falls down....

Structural Connectors for Engineered Lumber
Simpson Strong-Tie
800/999-5099
www.strongtie.com

Computer-Aided Design Software, Networking, and Related

Hey, I got this idea for a building, only I want to sketch it, then make contract drawings from it, then get a materials list and price projection, then make a 3-D virtual model, then make it look like a photograph, then make a movie from it, and email it and publish on my website...all in the same computer program...oh yeah, in color:

Java Compatible CAD and Visualization Software
MicroStation/J. Bentley Systems, Inc.
800/BENTLEY (800/236-8539)
www.bentley.com

IBM or Mac; Mac or IBM; IBM or Mac; ahhh...who cares?

Cross-Platform (IBM-Mac) Networking
Miramar Systems, Inc.
800/862-2526
www.miramarsys.com

Take a plane, fly it over a big piece of land with a 24,000-dot-per-inch resolution scanner, and get a survey that is accurate to one-tenth of an inch per vertical foot of elevation. And it costs about one-tenth as much as a regular survey:

Aerial Digital Mapping And Photogrammetric Surveying
Land & Mapping Services
814/765-9370
www.landmapping.com/index.shtml

New and Recycled Content Cements

Limestone production consumes vast amounts of ozone-depleting fossil fuels, but it is a major component in concrete. Slag is a stable waste product resulting from the production of steel. Replace the latter with the former and you have saved the ozone

layer one big headache, and made the concrete stronger and better able to receive color:

Cement and Recycled Slag Additives
New Cem, Blue Circle North America
201/437-2575
www.bluecirclena.com

With a little help from your flowable-fill friends you can engineer poor soils with weak concrete slurries and make them suitable for use with geothermal heating systems where none seemed possible. In other words you can reengineer the ground:

Concrete Additives/Flowable Fills

Grace Construction Products
410/531-4000
www.wrgrace.com
/bigframeswelcome.html

Take dumb old concrete, add some of this and some of that, cut it into blocks and panels, bake it, and you have a concrete that is 20 percent lighter than the conventional stuff, just as strong, provides as much insulation as any insulation batt or board per inch of thickness, is soundproof and bulletproof, insect- and moisture-proof, uses a readily available mortar that is 1/16" thick and stronger than the block itself, and will install much faster than conventional concrete block. Too new to be reliable you say? It's been around since 1927 and is used in 60 percent of Europe's new housing. Sources for special tools and connectors noted:

Aerated Autoclaved Concrete Block
Matrix PAAC
770/308-1500
www.matrixpaac.com

AAC Compatible Parges and Stuccos
Sider-Oxydro, Inc.
478/892-9800
www.sider-oxydro.com

AAC Saws and Miscellaneous Tools
PAACE
888/594-8466
email:
paac_equipment@worldnet.att.net

AAC Anchors and Fasteners
Powers Fasteners
www.powers.com/powers.htm

Roofing, Roof Decking, Flashing, and Decorative Parapet Caps

What if you had a high-tech roofing material that looked somewhat like conventional metal roofing, only you could paint it any color you wanted (or leave it natural) and it got stronger in salt-laden air and industrially polluted air by bonding with airborne chemicals and impurities. And a guy they called "Doctor Z" invented it? And it lasted for decades?

Stainless Steel/Zinc-Coated Roofing Products
Follansbee
800/624-6906
www.follansbeeroofing.com

Alternative tech, recyclable, ages beautifully, flexible, superb as weather flashing, formable as parapet caps, and uses no adhesives. Why not?

Copper Sheet Products
Revere Copper Products, Inc.
800/448-1776
www.reverecopper.com/index.htm

OK, so now you have a roof deck and a giant stair and you need an Energy Star-certified, recyclable-content roofing material that works perfectly with adjacent metal details and is slip-resistant and nearly paper-thin, and so good in rain and wind that it is sold as waterproofing and used as underlayment in planted green roofs?

Roofing and Waterproofing Systems
Sarna/Sarnafil Division
781/828-5400
www.sarnafilus.com

Thermal and Acoustical Insulation Products

Recycled-content and recyclable plastic insulation board that will help superinsulate your home.

Polyisocyanurate Insulation Panel Products
Johns Manville/Roof Insulations
303/978-2914
www.johnsmanville.com

What if you could manufacture a glass-and-air combination sheet that was strong, lightweight, able to be saw cut, provided high-efficiency thermal insulation, was insect- and moistureproof, and lasted sixty years or more with no deterioration?

Cellular Glass Insulation Products
Pittsburgh Corning Corp.
724/327-6100
www.foamglasinsulation.com

In a world where policy-makers are always searching for new markets for recycled products there exists a humble construction board that is 100-percent post-consumer recycled newspaper. Basically baked and pressed industrial papier maché, it is used for everything from acoustical insulation to roofing panels, and has been in continuous for the better part of 100 years:

Recycled Post-Consumer Waste Paper Products
Homasote Company
800/257-9491
www.homasote.com/index.html

Another insulation product with recycled and recyclable content, this one is thin aluminum foil, pressed together with plastic cells, and relies on reflectivity to achieve energy savings. Inexpensive and easy to install, it can be considered an integral part of any radiant heating system:

Reflective Insulation
Low-e/Environmentally Safe Products
800/289-5693 (East Coast)
775-841-3533 (West Coast)
www.low-e.com

This is recycled Levi's jeans cuttings that have been made fire-retardant and insectproof with borax, and useful as thermal and acoustical insulation because of a patented 3-D weave. No, really....

Natural Fiber Insulation
Bonded Logic, Inc.
480/812-9114
www.bondedlogic.com/company.htm

Panelized Building Systems

I'll take a high-efficiency insulation sandwich made with, ah, let me see...OK, oriented strand board, hold the adhesives, deliver it to my site, and have it set up with a small crew and a lightweight crane. Oh, yeah, and I built my house with this stuff in two weeks:

Structural Insulated Panel Products
Winter Panel Corp.
802/254-3435
www.winterpanel.com

Finishes

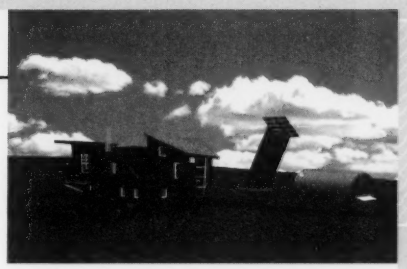
The problem used to be that in order to get paints to dry quickly you had to have bad things like volatile organic compounds. Then some researchers figured out how to make the paint dry by eliminating almost all of these bad VOCs, and almost all the paint odors associated with them. Healthier, less down time. Win-win:

Low VOC Paint Finish Products
Eco-Spec / Benjamin Moore & Co.
201/573-9600
www.benjaminmoore.com

Appliances, Equipment, and Related Products

Lord Rumford invented a reflective fireplace around 200 years ago, but

e-House2000 Resources



it was so good nobody seemed to believe it was true. It looks like a regular masonry fireplace, but is so efficient it outperforms and burns cleaner than those metal ones with the glass doors. You also have to be careful to put in a small, cost-effective one, or—even with just one or two logs—the heat it generates will overwhelm you and drive you out of the house:

High-Efficiency Heating Fireplace and Masonry Oven Products
Rumford Fireplaces
(West Coast Supplies)
360/385-9974
www.rumford.com

Superior Clay Corporation
(East Coast Supplies)
888/254-1905
www.superiorclay.com

If you have an old, non-Rumford fireplace and want to high-techify it so that it burns with extraordinary efficiency, buy one of these:

High-Tech Fireplace Grate
Andiron Technologies, Inc./
Ecofire Super Grate
650/330-1051
www.ecofire.com

Compact dishwashers and washer-dryers engineered by tough-minded Swedish people who demand compact, elegant, long-lasting, energy-efficient machines that minimize the use of detergents, and maximize the life span of whatever is being cleaned. And they get exactly that:

Energy-Efficient Appliances
ASKO USA, Inc.
800/898-1879
www.askousa.com

Present technology: build your vacuum into the walls, and empty everything into one easily maintained bag in a basement or closet; then add a portable steamer to clean and sterilize without chemicals
Future technology: have a robotic vacuum do it for you:

Whole-House Integrated Systems/ Robotic Vacuum Cleaners
The Eureka Company
800/282-2886
www.eureka.com

If I only had a brain, I could really cook, then I'd be made by robots and have computer controls in my backside:

Networkable CAD-CAM Modeled Manufactured Cooking Equipment
Garland Commercial Ranges Ltd.
905/624-0260
www.garland-group.com

Heating and Cooling Systems

Ja! We are German with amazing radiant heating and cooling and snowmelt technologies that run in little tiny plastic pipes in your floors and ceilings and roofs. So efficient! *Und* we also distribute the biological process in plastic tanks that go into your basement, and process waste water and sewage so cleanly that drinking water you can be getting:

Radiant Heating and Cooling Products
Roth Industries
888/316-7684
www.roth-usa.com

Biological Decentralized Sewage Treatment
Busse GmbH
www.bussegmbh.de

OK, OK, let's see if this stumps you: I need a whole house heating system that also gives me unlimited amounts of hot water, both produced with almost no energy. It should be controlled by a computer chip for maximum performance at all times, and the whole thing has to be about the size of a small suitcase.... Shippable when you say? Now?

High-Efficiency Instant Domestic Hot Water and House Heaters
BAXI S.p.A.
www.baxi.com
distributed in the US by:
BAXI-USA
Big John Sales
330/887-1517
www.bigjohnsales.com

Energy Saving Ventilator Products
Venmar
800/567-3855
www.venmarvent.com

Ultra-Efficient Dehumidifier Products
DEC International, Inc.;
Therma-Stor Products
800/533-7573
www.thermastor.com

Home-Automation/Whole House Electronic Controls

A control freak's dream come true: Little computer chips in your home appliances and heating equipment access information and provide on/off commands made by a software program that tracks energy efficiency. And sensors track roof leaks and other undesirable moisture accumulation, and provide an early-warning system for problems in your house. The whole thing is transmittable anywhere in the world you might want to be, using a hybrid satellite system that provides "always on" high-speed broadband download-uplink Internet access using the same antenna. Oh, yeah, and you can watch TV on it:

Home Automation Products
X-traWeb Inc.
801/575-6600
www.x-traweb.com

High Speed Satellite Internet Access
Hughes Network Systems
301/428-5500
www.hns.com

Alternative Energy/Uninterruptible Power Source Equipment

California leads the nation in trends, so picture this: Your power goes out. OK, so you're like, whatever, dude. You have an uninterruptable solar-powered power source that clicks in instantaneously so that you don't know your power is off, man. That's because it all happens, like, at the speed of light or something, and has battery back-up in case the sun isn't shining. And you can sell your excess solar-generated electrical capacity back to the power company that is, like, overpaying for fossil fuel and stuff. So, you *are* the power company, man. Or maybe you just use that hydrogen-powered fuel cell that throws off recoverable water and heat as waste products, to, like, power your organic greenhouse. And the stuff costs, basically, not too much more than fossil-fuel-powered generators, man. It's awesome:

Photovoltaic Products
BP Solar
301/698-4208
www.solarex.com

Photovoltaic Controls and UPS Products
Trace Engineering
360/435-8826
www.traceengineering.com

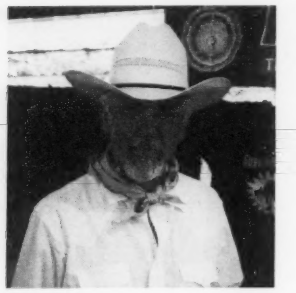
Thermal-Solar Collector Products
Thermomax
410/997-0778
www.thermomax.com

Fuel Cells
Plug Power
518/782-7700
www.plugpower.com

TEXAS
GREEN

That's Right ★ I Said A Texas Wind Boom

By Russel Smith



Russel Smith is the executive director of the Texas Renewable Energy Industries Association in Austin, Texas.

For some it's a hard pill to swallow—Texas as the national leader in renewable, green energy. The Texan oil-drilling fever has left the state looking like a giant pin cushion. Texans drive more miles in more pickup trucks and SUVs than folks in any other state. Grandfathered power plants and industrial facilities spew tons of nasty stuff into the air every day. Houston battles L.A. over air-pollution bragging rights.

In Texas, like everywhere else, there are hard cases on both sides of the fence—smokers and anti-smokers. Neither can separate rhetoric from reality. Through the years they have backed themselves into some pretty distant corners and thrown up brick walls, plus a few walls of eco-correct adobe. These walls define the rules of engagement.

The media plays to these hardened positions. Texas populist philosopher Jim Hightower built a career based on his precept that "There's nothing in the middle of the road but yellow stripes and dead armadillos." For Texan ultra-conservatives, all "moderates" are spineless. We've become quite comfortable with a "them and us" world. Lord help anyone who tries to break that mold.

US: If we could just overcome the agents of darkness, renewable energy could power the world in short order.

THEM: Renewable energy is a joke and its proponents are dunces. There is plenty of fossil fuel remaining if industry is allowed to go after it. And there is no reason why we shouldn't burn all of it.

US: This new fuel-cell-powered scooter will revolutionize our transportation system.

THEM: They just want to take away our trucks!

US: The energy industry is populated by greed-heads who don't care a whit about the future of the Earth.

THEM: If the environmentalists and renewable energy nuts hadn't held sway the past several years, California wouldn't be in the mess it is in.

US: Shut up and open wide!

THEM: You can't make me take my medicine!

In Texas, the renewable energy community has tried to walk a different path. Let's get to some basic principles. Reasonable folks can disagree. Our aim in the Texas Renewable Energy Industries Association (TREIA) is to seek the goodness in people, expect the best, be prepared for less, and always engage, always try to develop personal relationships across those walls.

Many of the right things happen for many of the wrong reasons. "Meeting market demand" is why narco-lords in Colombia got rich. Passive solar water heaters do not a revolution make. It will be very hard work just to meet the growth in energy demand with renewables, much less meet the vast existing demand. In the near term, renewables are likely to remain a small though critical piece of the energy pie. Renewables will not replace fossil-based energy this year or next year, but with enough good seeds planted, renewables could become the kudzu of the energy world.

TREIA was formed in 1984 to unify all the renewable energy sectors (solar, wind, biomass, geothermal, and hydro). We wanted to avoid the "balkanization" of the green effort. TREIA was spun out of the Texas Solar Energy Society, an educational group formed in 1976. TREIA was born in the midst of an alternative energy movement that was hostile toward large centralized power production, utility companies, and industry in general. TREIA was different.

TREIA was a broad-based renewable energy trade group that actively recruited utilities for membership. We encouraged utilities to compete in renewable energy development. Photovoltaic use in the oil patch sparked the industry. A Houston oil rig company—Skytop Brewster—was the first to cross over and build wind towers in the 1980s. One by one, members like Austin Energy, the Lower Colorado River Authority, TU Electric, Houston Light & Power, Enron, and City Public Service developed renewable energy components.

TRIEA fostered the proposition that oil companies—yes, oil companies—will ultimately become broad-based energy companies. We offered them the prospect of a ready-made path to large-scale adoption of renewable energy technologies.

TREIA accepted that centralized, large-scale facilities pushing renewable electrons through the national grid are absolutely required. Small-scale renewable energy measures are a reality, and a desirable and necessary part of our energy future, but we need to think Texas-sized if we expect to have a significant impact on the environment within our own lifetimes.

TREIA brought environmental groups, consumer groups, and governmental agencies into its membership and to the same table with utilities.

TREIA knew that Texas had made a transition from being an energy-producing state to its current sorry status as a net energy importer. We pointed out that fact at every opportunity.

During the mid-90s, the state of Texas developed and implemented a utility process called a Deliberative Poll™. This was part of the state's Integrated Resource Planning, and it involved polling by the Public Utility Commission (PUC) of Texas. This poll required the state's utilities to find out what their ratepayers actually wanted when it came to adding electrical capacity to the system. Furthermore, it required the utilities to actively respond to those public desires in their growth plans.

These polls had astounding positive effect. They showed overwhelming customer support for the addition of renewable energy sources. Not only did folks from all regions of the state of Texas say they wanted clean, renewable power on the system, they

indicated their willingness to pay more for it (mostly from $1 to $5 a month). There was also a preference for the cost to be shared by all users. This was a significant underpinning for the decisions yet to come. It resulted in the development of 188 megawatts of wind-generation projects.

It is important to note that this PUC was appointed by then-Governor George W. Bush. The generally conservative state legislature, and the governor himself, took note and took to heart the clearly expressed and documented "will of the people."

Opponents of any large-scale use of wind and other renewables chanted their usual mantra— "costs too much, costs too much." And yes, it does cost something. Many "green pricing" programs required individuals to buy blocks of renewable power, costing them from five to fifty extra dollars a month. But when the cost of green projects was spread across the rate base (with every user paying), as much as 2,000 megawatts of renewable power could be added to the Texas utility system for less than twenty cents per ratepayer per month.

TREIA supported a strong green pricing rule that was, indeed, implemented by the state's utility commission. But we focused on pressing for policies aimed at spreading the cost. A green pricing option is best suited to municipal utility services that choose not to opt in to competition.

It seemed to us that Integrated Resource Planning was advancing renewables successfully throughout the state's regulated utilities. Then utility deregulation came ripping through like a wild stallion. For years, TREIA was no supporter of utility deregulation. But when it appeared that resource planning was going the way of the mastodon, and that deregulation would be pushed through the legislature in 1999, TREIA helped shape a Renewables Portfolio Standard. This required the development of 2,000 megawatts of new, renewable power in Texas by 2009.

We joined as a stakeholder, helping to write the related public utility rules. That cooperative effort was the result of over twenty years of industry relationships and bureaucratic groundwork. And it's most definitely working. A short five years ago, the grid-connected network of Texas had virtually zero renewable power. Over the last several months, almost a thousand megawatts of new renewable energy projects have sprung up. They're mostly wind, plus a little landfill methane. All are projected for completion by the end of 2001.

As is often the case, Texas had the considerable benefit of watching a policy unfold first in the great state of California. During the shaping of Texas' Electric Utility Restructuring Act, a conscious effort was made to avoid a few problems we Texans perceived in the Californian approach.

Under the Texas Law:

- The PUC took steps to assure that plenty of generating capacity was built in, before the deregulation.
- Long-term wholesale contracts are encouraged.
- "Postage stamp" transmission rates facilitate long-distance wheeling of power.
- Significant curbs are in place to keep incumbents from dominating the market.
- When it seems necessary, the cost of building transmission for renewable energy projects can be spread across the rate base.
- Utility companies are broken up into generating companies, transmission-and-distribution companies, and Electric Service Providers (ESPs).

Some especially innovative ideas were developed to give the Renewable Portfolio Standards a real chance to succeed. The RPS was designed as a "market-based" approach. Renewable energy resources compete to win bids, as utilities move to fulfill their required allotments of renewable power. There are no set-asides for specific renewable resources, no green scheme that gets mandated regardless of cost. This avoids political infighting over a pool of money.

The Texas Renewable Portfolio Standard has been worked out in quite some detail.

ESPs have to prove they have met their renewable requirements by using Renewable Energy Credits (RECs). That REC represents one megawatt-hour of renewable energy, produced somewhere by a green generator. The REC must list the source of the energy, and is an authentic proof of its claim to greenness. But the megawatt-hour of electricity and the REC that it creates are not associated—a generator of renewable power may sell them separately, or together.

ESPs who fail to have these credits properly placed in their portfolio will be penalized $50 per megawatt-hour. This is quite a bit higher than the cost of buying RECs.

Due to the recent flood of renewable power bids, with the economies of scale being realized, some utilities in Texas are realizing the genuine benefits of wind power. It's been hard to miss the recent upswing in the price of natural gas, while wind offers a stable and increasingly competitive price, available in long-term wind power contracts. Even though municipal utilities are not required to join in market competition, and are not covered by the Renewables Portfolio Standard, some are buying in rather heavily to meet demand for their own green programs. Austin Energy bought seventy-seven megawatts, while the City Public Service of San Antonio pitched in for twenty-five. The official benchmark for Texan green power at the start of 2003 was four hundred megawatts; contracts already announced more than double that sum. The whole concept of deregulating electric utilities may ultimately prove to be folly. There are certainly a number of compelling arguments to support that possibility. I've made many of them myself. But we have cast our lot in Texas. It is our hope and expectation that regardless of what happens in the longer run, the renewable energy activity spurred by that choice will make renewable technologies fully competitive in Texas, and beyond. We'll be ready to catch that bronco and ride it as far as we can.

Texas will ultimately become the leading state in renewable energy development. With its blistering sun, howling winds, and plenty of open space, Texas simply has the greatest physical potential for green energy. The state's economy understands and relishes energy production. The collective psyche of Texas hankers for leadership. State independence and individual self-reliance are touchstones of Texan society. We will never forget those famous words from *The Life and Times of Judge Roy Bean* (though maybe he never said them) —"For Texas and Miss Lily!"

Texas Renewable Energy Industries Association (TREIA)
P.O. Box 16469
Austin, TX 78761-6469
512/ 345-5446, www.treia.org

www.RenewableEnergyRoundup.com

www.treia.org

www.txses.org

www.infinitepower.org

Big Downtown Solar

by Mark Kapner

Imagine urban buildings that harvest sunlight. Their walls are photovoltaic—directly converting sunlight into electrical power, using solid-state semiconductor wafers or thin films mounted on panels. There's no fuel consumed, no sound, no maintenance, no moving parts, and no pollution of any kind. And it makes money.

Most PV systems are mounted on racks or on poles. A skyscraper is a giant rack. These vast power-generating surfaces can supply everyone within the building and, at midday, can export power throughout the city. No need to store any power—the city's utility grid still supplies power at night, and during clouds and rain. The enlightened power company—say, Austin Energy, owned and run by Austinites, for whom I happen to work—pays the building owner for the juice supplied to the grid. Not only would this work financially and physically—the buildings themselves would look great!

Using solar panels as a structural component is known as BIPV, Building Integrated PhotoVoltaics. Solar panels replace conventional walls or roof cladding. Labor that might have been wasted on a conventional roof simply mounts the electrical skin. Installing solar from the get-go saves on real estate and site development costs. The utility wires the building, so there's no need for new interconnections. *Best of all, it's hard to imagine any more visible and public commitment to sustainability than the roof, walls, and awnings of a major-league urban skyscraper.*

Building-Integrated Photovoltaic Designs for Commercial and Institutional Structures
A Sourcebook for Architects
Patrina Eiffert and Gregory Kiss
2000; 92 pp.
National Renewable Energy Laboratory, NREL Document Distribution Service, 303/275-4363
Downloadable as a .pdf file at www.nrel.gov/publications/

Photovoltaics in Buildings
Friedrich Sick and Thomas Erge, eds.
1997; 297 pp.
$75
James & James Science Publishers

Solar architect Steven Strong pioneered this concept in his 1980 solar home design for a client in Carlisle, Massachusetts. In the 1990s, BIPV began to take off in Europe and Japan. Dozens of photovoltaic-clad buildings were constructed in Switzerland and Germany.

Recently fifteen exemplary photovoltaic-integrated buildings were documented by architects Gregory Kiss and Dr. Patrina Eiffert.

Austin Energy will furnish the PV materials for a gigantic sunscreen for our city's new convention center expansion, now under construction. This power-producing sunscreen will filter sunlight on the western wall, daylighting the lobby and lowering power bills at the same time. We're also putting up solar sunshades over city parking lots throughout town.

A private group of investors in Austin will clad our new "world class" performing arts center in PV roofing and façade, turning the Center into a small generator between performances.

The solar industry now offers quite a variety of solar products integrated into buildings:

- Electricity-producing glass panels. These substitute for curtain wall spandrels (the opaque glass between rows of windows).
- Encapsulated wafer-type solar cells. These wafers are sandwiched between layers of glass and spaced out to allow light transmission between the cells. These panels create a beautiful pattern of diffuse light during daylighting.
- PV roofing systems specifically designed for flat roofs.
- Rigid roofing tiles and flexible shingles; PV panels compatible with metal roofing and awnings.

Photovoltaic panels don't come cheap, but almost every major building budgets something for sheer character. Imported granite or polished marble goes for about the same price as photovoltaic "building skin." The difference? A solar skin has a cash-flow stream! A marble façade can deliver only prestige—as the soot and acid rain of a fossil-fueled city slowly eat it away.

Mark Kapner labors in the vineyards of renewable energy for the city-owned utility of Austin, Texas.

The City of Austin's Green Building Program
www.greenbuilder.com/sourcebook/

Austin Energy
www.austinenergy.com/greenchoice

GREENER THAN THOU
Renewable Energy for the Mass Market

By R.W. Rushing

R. W. Rushing is the president of the National Green Power Company (www.nationalgreen.com), based in Austin, Texas.

I Was a Dot-com Refugee

Last spring my company came to a screeching halt, along with the rest of the Internet world. I've still got bills to pay, but the idea of taking another high-tech job selling WidgetWare 3.0 for the greater enrichment of shareholders gave me indigestion. And while moving to a trailer home in Utopia, Texas and living off-grid sounds great to me, my wife wasn't too hep on the idea.

I wanted to do something meaningful. It sounds sappy, but I really wanted to get up every morning, go to the office, and save the planet. While also, hopefully, making a decent living.

So, I started a renewable energy company. After all, the nation's deregulating electric utility markets meant that a $300 BILLION industry was getting its salad tossed. Surely a few croutons would fall my way. My marketing background would come in handy in a business that had never had to market itself before. And most of all, I saw that energy's most promising new technologies in wind and solar power were being ignored or minimized by the established utilities.

The business I started, National Green Power Company, empowers homeowners and business people to take personal responsibility for the environmental impact of the electricity they use. In deregulated states, our customers can have their electricity 100-percent generated by solar, wind, and hydroelectric power sources, and delivered over the existing electric grid.

I was lucky to put together a team of highly experienced utility and operational people and investors for National Green Power Company. Our mission was simple—create market demand for renewable energy.

Historically, renewable energy has been driven by supply-side government mandate, followed resentfully by the electric utilities. Our theory was that creating a group of customers who demand renewable energy would be the best way to bring new renewable energy sources online. And each new wind turbine or solar panel translates into reduced air and water pollution.

Photo courtesy nationalgreen.com

National Green gets its renewable power from wind farms like this one overlooking the West Texas town of McCamey.

While this mission may sound like futuristic pie in the sky, it's quite straightforward. Energy can be created very economically from plentiful, natural sources. Renewable energy sources are already constructed and producing energy now. All it really takes at this point is consumers. Once consumers understand that using renewable energy makes sense, is cost-effective, and will help sustain the economy and the environment, they will create a demand that develops renewables. Once the consumer is in the driver's seat of the network, and choosing renewable energy, everyone wins except for old, polluting power plants.

Leading research firm The Yankee Group reported that 40 percent of all consumers would switch to affordable renewable energy. So, why doesn't this happen? There are several reasons. A big one is sheer lack of understanding of the energy grid—how renewable energy

is created and how it makes a difference. The challenge is to raise awareness of renewable energy among consumers, and to make it easy for them to switch from the past to the future.

Fossil-Fuel Electricity: A Dirty Water Hog

Few people realize that 80 percent of Greenhouse gases are caused by fossil-fuel electricity generation. To coin a phrase, where there's fire, there's smoke. That's why National Green has pledged to use only noncombustion technologies such as solar, wind, and hydroelectric power for our customers' electricity.

As my friend Tom "Smitty" Smith, director of Public Citizen of Texas (a consumer watchdog agency created by Ralph Nader in the 1970s), said, "Most people don't realize that because of the enormous improvements in automobiles and their emissions, power plants create more pollution than automobile emissions. Changing the type of power we buy for our own consumption is the least costly and most effective step we can take to reduce emissions."

Go to any environmental website, and you'll read plenty about the hazards of traditional power plants. Burning fuel doesn't just make the air dirty; it also contributes to acid rain, global warming, even asthma.

Although the 1970 Clean Air Act put pollution regulations in place for new plants, older plants, the same ones that create the most pollution, were "grandfathered" and held exempt, even from these 31-year-old regulations. These old plants emit up to ten times as much nitrogen oxide and sulfur dioxide as modern combustion plants.

Even modern plants pollute the air. They also rely on foreign sources of fuel that create price instability.

Few people know that each household requires 100,000 gallons of water per year just to create the electricity it uses. But so says the US Department of Energy. All fossil-fuel technologies (coal, oil, natural gas) as well as nuclear use their fuel to boil water. The pressurized steam spins a generator to create electricity. In areas with water-shortage problems, like my own American Southwest, a switch to solar and wind power is a huge step toward alleviating not just our tainted air, but our water crisis.

Not All "Green" Is Green

Most likely, most everyone in America will have the option of choosing a "green" electricity program in the next few years. It will come either from an independent environmentally dedicated provider like National Green, or as a green program from their old utility. Here are a few "insider" details on that process.

Some of our competitors who call themselves "green" are adding fossil-fuel combustion sources like natural gas into their "mix"...as much as 98-percent fossil fuels! And not all renewable energy technologies are environmentally friendly. Landfill gas, for example, is called "green," even though it relies on polluting combustion, just like a fossil fuel.

I find this depressing, because I recognize the public's intelligence. People will eventually discover that the terms "green" and "renewable" are not necessarily reliable. There's some risk that the public will get jaded and cynical about "green electricity," killing an opportunity for a powerful market-driven solution to our air and water pollution problems.

Maybe we need a shiny new term for noncombustion electric generation. Envirolink, a Pennsylvania-based environmental watchdog group, has proposed "deep green."

Let's get hands-on with the leading renewable energy technologies:

Solar Power

The photovoltaic effect was discovered in the 1800s, but almost unused until the 1960s, when a low-maintenance power supply was needed for spacecraft. Solar power emerged into public consciousness during the 1970s "energy crisis" and it continues to be the best-known alternative electricity source.

Solar energy is captured and transformed into electricity through photovoltaic (PV) technology. These semiconductor materials absorb light, then release electrons, which

flow through an external circuit to generate electricity. PV systems convert about 15 percent of the sunlight that strikes them into energy.

Most solar power is used for off-grid applications. There are large up-front costs involved in creating largescale PV systems, and the payback is slow. Except for niche applications far away from grid wiring, this keeps PV noncompetitive.

But PV chips and wiring are still all around. In the United States in 1998, PV systems generated more than one billion kilowatt-hours of electricity a year, and more than one billion handheld calculators, watches, and battery chargers were solar-powered, according to the Center for Energy Efficiency and Renewable Technologies.

Wind Power

Wind power is far older than solar photovoltaics, dating back at least to thirteenth-century Europe. Today, wind is the world's fastest-growing electricity-generating technology, growing very rapidly over the past decade. Modern wind generation hit America in the 1980s. Now, about one percent of the nation's power on the grid is provided by wind.

In July 2000, the price of wind power dropped below the price of electricity produced from natural gas, into a range competitive with coal and nuclear power. Suddenly, a lot of big utility execs were interested.

Modern wind turbines stand 200–300 feet tall and cost $1 million each. An onboard computer adjusts the blades to turn in the direction of the strongest wind, which increases their electricity output. Denmark is the world's leading wind turbine producer. That country turned away from nuclear power in the 1970s in favor of wind power, and is now reaping the benefits of the booming global wind power market.

In 2000, the Department of Energy announced in its strategic plan, "Wind Powering America," that wind will provide 5 percent of the US's electricity by 2020. Wind power is already the technology of choice in Europe.

Even with today's technology, wind turbines installed on less than one percent of US land area could provide 20 percent of the nation's electricity. With the land stewardship practices of modern wind farm developers, the land surrounding wind farms can simultaneously be used for farming and ranching.

Let's consider a single 750-kilowatt wind turbine operated for one year at a favorable site, where winds average 13 miles per hour. By standing tall in a field and whirring, this million-dollar tower can displace fossil-fuel sources that would produce 1,179 tons of carbon dioxide, 6.9 tons of sulfur dioxide, and 4.3 tons of nitrogen oxides. Since wind energy does not burn up, the tower does this each and every year. And since the wind knows no borders, foreign suppliers can't game the wind supply with cartels and embargoes.

Alternative Energy Awareness Rising

While the latest energy crisis disgraces the cover of every newsmagazine these days, renewable-energy companies and environmental organizations are trying to raise awareness of clean energy. It's a tough battle. One unexpected benefit of the California energy crisis is that the public seems willing to realize where their electricity comes from. And once you know this, you also know that it's your responsibility. Bottom line: thanks to deregulation and new technology, we are closer to personal control of these vast networks than we have ever been.

RESOURCES

What is the average wind speed in my region?
www.awea.org/faq/usresource.html

Top twenty states for wind-energy potential:
www.awea.org/pubs/factsheets/top202001.pdf

Good standards for "deep green" electricity:
www.green-energy.org

Calculate your personal CO_2 footprint:
www.SafeClimate.net

THE FINAL CATALOG

by Bill Crawford

Bill Crawford is a writer and a soccer dad in Austin, Texas. He is a member of the SunRiver Cartel, the editors of Texas Death Row.

It is 10 a.m., a leisurely eighty hours before my scheduled execution. The guard walks into my cell at the Terrell Unit of the Texas Department of Criminal Justice, about twenty miles from the execution chamber in Huntsville, Texas. The guard hands me two forms. The first is "Final Meal Request." I pick up a soft fibertip pen and carefully scrawl my choice between the black lines—two cheeseburgers, french fries, and Coke. Yes, I know that this is the most requested final meal in Texas—but I just like the food.

Then I tackle the next form, State Form Number 77343. This form is easier to fill out: it's designed for the subliterate. There's a column of boxes on the left side of the page and a column of colored pictures on the right. I study my final catalog carefully. There's a hypodermic needle, a large chair with straps, a manila noose, a shotgun, and a tall wooden structure supporting a slanting blade.

Not everyone in Texas is happy about consumer empowerment being carried into the death row cells of our prison system. But this is, after all, the last choice I'm likely to make, and a civilized people tends to be indulgent about this. Most Texans condemned to the final penalty admit their guilt and prepare for their death. Many undergo a religious conversion. If one believes in such things, then heaven must be full of Texans who found God precisely because they were sentenced to execution.

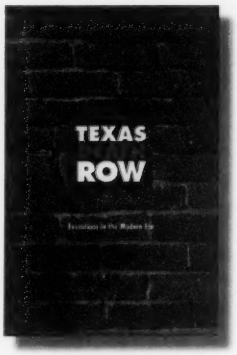
Texas has long been a pioneering state. Since word got out that the state went pro-choice on death, I've gotten dozens of letters and emails from sideline design critics, in and out of the state, recommending one technique over the other. I've enjoyed long chats about the matter with my attorney, my chaplain, and the prison's public relations officer. I admit that I've done something horrible. I want to make amends. I want to ease the suffering of the people that I have harmed. I'm plenty tired of living in a Texan prison. I'm ready to go; I just want to see it done right.

Texas leads the United States in executions—more than 260 since the reinstitution of the death penalty in 1982, a record-breaking forty in the year 2000 alone. Texas pioneered lethal injection, the modern technology that has become the most popular among the thirty-eight American states also authorizing the death penalty. When the federal government built its own death chamber for federal prisoners in Terre Haute, Indiana in 1995, the technology imposed was the Texas-style needle.

The Eighteenth Amendment to the US Constitution prohibits "cruel and unusual punishment," but ideas of cruelty always change with advances in technology. During the enlightened days of the French Revolution, a physician named Joseph Ignace Guillotine developed a device swifter and more humane than the gallows. The guillotine remained the national execution technique until the French abolished capital punishment in 1981.

American innovators designed the electric chair. Big business had a substantial role here. In the 1880s, George Westinghouse and Thomas Edison were duking it out to see whose electrical-generating technology would become the standard American source of energy—Edison's direct current system, or Westinghouse's alternating current. Edison launched a public relations campaign designed to prove that alternating current was lethally dangerous. He hired scientists to travel across the country publicly electrocuting dogs, cats, and horses. Edison rejoiced in a public relations coup when New York State switched from the gallows to an electric chair powered by a Westinghouse AC generator. Unfortunately for Edison, however, AC proved to be more efficient not only for executions, but also for lighting homes.

In 1924, the State of Texas mandated the electric chair after a series of gruesome hangings by underqualified county sheriffs. Texas centralized the state's execution procedure at the Walls Unit of the Texas Department of Criminal Justice in Huntsville, Texas. In Bexar County, the "well oiled and pliable piece of Manila hemp" previously used for hangings was reclassified as a "tow rope." The electric chair was



Texas Death Row
Executions in the Modern Era
SunRiver Cartel
2000; 204 pp.
$15.95
Longstreet Press

durable, impressive, and high-tech, but as a design choice, it was hard to describe it as any less "cruel" or "unusual". A surge of 2,000 volts at ten amps had pronounced side effects—loud gurgles, foaming mouth, burning hair and skin, not to mention the result on eyeballs. In July of 1999, Allen Lee Davis, a 300-pound offender nicknamed "Tiny," was put to death in the Florida state electric chair. Blood soaked his shirt as his face contorted. The Florida Supreme Court posted photos of the execution on the Internet. Governor Jeb Bush dismissed the incident as a "nosebleed," but Florida began the process of conversion to lethal injection.

In 1999, Americans conducted ninety-eight executions. In sheer numbers, America ranks just behind Saudi Arabia, Iran, and China. Each society makes its own technological decision in these intimate matters. The Chinese, a Marxist nonconsumer society, are particularly renowned for their one-size-fits-all efficiency. China executes more than a thousand people each year, the vast majority of them in a remarkably simple procedure. The offender is bound, forced to kneel, and shot in the back of the head. If the offender has donated his or her organs to medicine, they are extracted (if not donated, organs have sometimes been known to vanish anyway). The emptied corpse is shipped to relatives for burial.

Though they scrimp on high-tech and end-user choice, the Chinese range of lethal offenses is more generous than America's. A Chinese offender can receive the death penalty for sixty-eight different crimes, including government corruption and tax evasion. "Our resources are limited," Hu Yunteng, a death-penalty scholar at the Chinese Academy of Social Sciences, explained to a gathering of legal experts, "and when a person takes resources from the country through corruption and hurts the living standard of other people, it's considered a grave offense."

The American prison system has far more resources than the Chinese and does not rank crimes or punishments in terms of dollar value. Try to imagine the execution, by lethal injection, of a corrupt American government official. Picture a soft-money party fund-raiser in the electric chair, or a tax-evading lawyer shot dead.

By American standards, consumer choice for the condemned is vastly more realistic. Prisoners could easily get their choice; the problem here comes from competing interest groups. In the case of execution technologies, three monopolists roadblock a free market of informed consumers. These are the taxpaying public, the politicians who regulate executions, and the prison personnel who actually kill people.

The loudest public advocates of the death penalty are the relatives of victims. One might think that the aggrieved parties would demand the most cruel and unusual punishment possible. But they don't; they're not seeking particular methods, just a source of closure. They could sensibly be written out of the process. Much the same goes for politicians, who use the death penalty to grandstand and ignore the specifics.

Executioners have the most direct influence. Jim Willett retired this year as the warden at the Walls Unit in Huntsville, where his signal put the final process in motion, and he personally witnessed the death of eighty-nine offenders by lethal injection. The needle method is deservedly popular among executioners: it's easy to administer, and easy to watch. The offender appears to sleep peacefully before the lethal dose of poison is administered. Technical glitches like the inability to find a blood vessel, or so-called "vein blowout," are infrequent and are relatively easy to deal with.

Even the condemned have had at least an indirect say in the matter. This has long been recognized. Some victims' relatives resent this. Kathy Wilburn, whose grandsons were killed by Tim McVeigh in the bombing of the Oklahoma City Federal Building, complained to the press that the offender McVeigh "got to pick the time he was executed, virtually the way he was executed, and he's getting his last word."

Prisoners can manipulate the appeals process. And they can go down fighting. Texan prisoner Ponchai Wilkerson resisted his execution up to the very last moment. Not only did Mr. Wilkerson try to escape twice from death row, he resisted being taken from his cell to the death chamber and had to be gassed. When dragged into the execution chamber, he was held to a gurney with full arm and leg restraints (these Velcro straps are reserved only for the most defiant offenders). Instead of a last statement, Ponchai waited until the warden signaled the start of his execution, then spat out a universal handcuff and leg restraint key that he had been holding in his mouth. This final act of defiance precipitated a lockdown of the entire Texas state prison system.

Sitting in my cell, I face a critical consumer choice. The needle isn't working for me: using drugs is what got me in here. What if there's a blowout, and they have to reinject? There's far too much room for human error here, and, like anyone in prison, I definitely know that the system is full of errors. The electric chair is a vaudeville freak show, a relic straight out of the days of P.T. Barnum. Brains frying, blood boiling, who needs it?

A shotgun? Too personal. I don't want to be right next to the technician and his trigger. I find myself more and more attracted to the guillotine. It's not very Texan, but there's something very sleek, Gallic, and rational about it. Little room for error. The execution is instant. Drum rolls, that towering shadow, the basket...Will I remain alive for a few moments when surgically detached from my body? No, an old wives' tale. Forget about it. I check the form and hand it in. "It's gonna be a little messy, man."

"That's OK," the guard says, shaking his head slightly. "It's just part of the job."

THINK TANKS

General Thinking: A Digital Guild

By Tucker Viemeister

Tucker Viemeister helped found Smart Design, famous for the OXO Good Grips kitchen tools (see Whole Earth, *Summer 1999). He opened frogdesign's New York City studio. Tucker is also a dot-com veteran. People justly call Tucker Viemeister "the last industrial designer" because, while extending product design to information solutions in order to craft unique human experiences, he can seamlessly integrate all media.*

I rode my bike through the bleak New York City evening, headed for a gathering of general thinkers. That's not unusual for me, as I generally steer clear of getting too specific. But this meeting would be different, because it was the first time that more than three members of the group "General Thinking" had ever occupied physical space together!

I waved to Remo (the cofounder of the group) through the window of the restaurant as I chained up my bike. As I entered I began to get this weird feeling: somehow these people felt like my friends, but (and here's the weird part) I'd never met them before.

They even looked familiar. How could that be? It dawned on me that it was because we were all pre-selected by networking software that Remo Giuffré and his pal Geoffrey Gifford, two Australians, had just launched. We were witnessing the birth of a self-organizing system. It was looking sustainable.

To understand what's special about this network, I'll have to tell you about Remo, but before I get into the Story of Remo, here's a quick description of GeneralThinking.com. (Before I do that, in the spirit of full disclosure, I want you to know that I am Remo's friend. Because of that friendship, I was invited in as one of the first General Thinkers. I would have joined up even faster, if I hadn't been distracted by filling in the forms by my untimely layoff as Executive Vice President of Research and Development at my former employer, Razorfish.)

General Thinking is a loose kind of digital guild, gathering together in the Internet. It started because Remo set the ball rolling, and Geoffrey knew how to write the code to power it. They made the rules and built the playing field. They invited a few of their friends to play. The friends then nominated some of their friends to come along, and so on and so on.

No one is quite exactly sure why they were doing this or where it might lead.

General Thinking is meant to be a network of smart people who share this general idea: we all agree generally on the kind of things that would make the world a better place. It seems we also agree generally on how to make our own lives better (what kind of stuff we like in our lives, and the places we like to live in or visit). Through the method of growing the network, the process is self-selecting people who are already digitally connected.

Add to this that we are already an outgoing bunch (everyone is the friend of the person who nominated them). Then there's this weird little wrinkle, one more defining personality trait: we all like to do projects with people who have different points of views and different skills (that's what makes the quest fun). So General Thinking is an expanding network of creative people looking both for other people to include in their projects and for new projects to work on. More specifically, as the website says: "Most of our general thinking (hence the name) and collective experience as thinkers, developers, and strategists has been on the ground and in real marketplaces, thick with: people, merchandise, stores, theatres, restaurants, cafés, kiosks, catalogues, brochures, books, magazines, films, music—literally thousands of ideas touching millions of people."

Where did Remo get this idea? Remo is an Australian who built this store in Sydney called REMO General Store. It should be significant that he named it after himself (luckily his parents named him Remo). It was not a specialized store, but a general store. The very idea of this store was to collect and sell the best of things, like the ideal bathrobe, the perfect white shirt, the best soaps (Kiehl's), the quintessential khakis, the superlative goofy toys, etc.

Remo really liked talking to his customers, and finding out where they got their good stuff (so he could stock it in his store). So both the stock and the community grew. This led to a REMO catalog that became more like a newsletter. It described all the merchandise in an urban J. Peterman style, and spit back mucho feedback from his customers.

These stories were not just about REMO products, but also about cool things consumers found to see or do. This situation not only built him a nice little brand, but it began to create a community who had more in common with each other than the fact that they were wearing the same, perfect, white shirts. Remo mailed these catalog/newsletters around the world—because his kinds of people were scattered around in London, New York, San Francisco, Hong Kong, etc.

Remo the man and REMO the brand somehow merged. One day we passed a guy wearing a REMO tee shirt, so Remo says, "I'm Remo!" to the guy, who looks at him as if to say, "How can you be a tee shirt?" But that's just

it—Remo the guy really is REMO the shirt! And the REMO community values that kind of dedication!

The level of loyalty demonstrated by REMO customers is legendary. Remo has come to realize (after the fact) that the reason for this has as much to do with process as it does with content. In other words, REMO customers were always highly involved in the very process of merchandise development. It's no wonder then that REMO customers feel so loyal to the brand. They are, in effect, co-owners.

Remo likes to call this concept the "Network Branding & Communications Model (B=C)™ (US Patent Pending)." And on the fertile ground of the Internet, he's continuing to develop it.

The problem for his business was that Remo liked building the community more than selling his wares. So eventually things "came a cropper" (that's what happens in Australia). But that doesn't matter now. "It's only the tip of the iceberg."

Two things coincided at around the same time: 1) the Internet was invented and 2) the store went bankrupt! If only the dot.com boom had happened a few years earlier—then having no profit would have been viewed as a positive "New Economy" trait, and he could have pushed REMO into the ethernet with a splash. But instead the two events were reversed and he lost the store and also missed the bubble.

But there is a REMO site, www.remogeneralstore.com. Check out the history of the store, cool graphics, study the products. But you only get to have a kind of virtual shopping experience there (you can only "buy" things by "voting" for them).

Now Remo (expatriated to the US and living in New York with his family) and his pal Geoffrey (living in San Diego with his family) have built this new kind of REMO. They just changed the merchandise in the store for people and ideas—via the community of General Thinkers. They've hatched a sort of SimCity. And we early inhabitants of General Thinking think it will grow into a thriving virtual metropolis of cool ideas and projects. It may even lead to some real results to make us all happy. But who knows what they have hatched!

Neither the founders of this network nor any of its Network Thinkers are theorists by nature. We are seasoned marketplace participants—driven by a combination of pragmatism, instinct, and (in many cases) economic terror. This infant self-organizing system is made up of highly intelligent entrepreneurial and social human beings, a small group of strategists, designers, and developers—not some elemental matter or primitive protozoa or silicon chips. So far, we think we are near the top of the food chain.

How can you get in? Since all the Thinkers have been nominated by Thinkers, you'll have to find a Thinker to nominate you (the bigger the pool gets, the more likely one of your friends will be in it). The rest is easy, and I hope exciting and rewarding! Then when you're in, you can trade ideas on our bulletin boards or join with others to offer services.

Hybrid Vigor

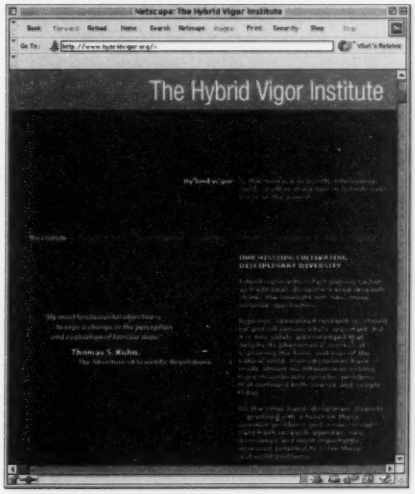
by Denise Caruso

Denise Caruso, who defines the very concept of digerati pundit, has been writing, editing, consulting, researching, and generally covering the scene in high technology since 1984. She's been a New York Times *technology columnist, Stanford lecturer, and scholar at Interval Research, but she is beginning the twenty-first century with her dream project, the Hybrid Vigor Institute.*

I'm pleased to be writing an essay for Sterling's iconoclastic guest issue of *Whole Earth* for many reasons, but one that I'll share is its connection with Stewart Brand, who founded this publication.

Stewart is a legend for many things, including his uncanny ability to bestow upon projects the perfect name, and I'm happy to say that he's responsible for ours. When I told him what I was up to a year ago—creating a nonprofit to encourage researchers to cross disciplinary boundaries—he immediately declared, "Oh, you should call it 'Hybrid Vigor.'" And so I did.

The biological term for which Stewart named the Hybrid Vigor Institute describes the good



juju that happens at the edges of a field when pollen from wild plants mingles with the cultivated ones, thereby increasing the strength and yield of the crops. (And, yes, we know it's an imprecise metaphor, please don't write and lecture us about it.) Hybrid vigor is also responsible for the rude health and longevity of crossbred animals (which led Stewart to add, "You could also just call it 'Mutt'").

Despite the fact that our intention is, in part, to produce some vigorous mutts from today's blue-blood academic stock, I want to make it clear that we are not trying to abolish disciplines such as biology or physics, sociology, or whichever your favorite may be. We love disciplines.

In fact, if you think of disciplines as tools for producing knowledge, which they certainly are (and which qualifies them for inclusion in this review, historically a catalog of tools), then disciplinary study—primarily manifested by academic departments in universities—has pick-and-shoveled an enormous pile of precious metal from the hard stone mountain of the formerly unknown and unknowable.

But even with all the gazillions of discoveries large and small that researchers have eked out, and as much as they might want to make it so, complex understanding cannot be mined with the same brute force as a discovery; picks and shovels can only yield the next chunk of raw gold, not a fully formed grail.

Disciplines are great for discovering cell proteins, for example, but not for preventing cancer. Or for measuring the impact of methane in cow manure on the ozone layer, but not for stopping the planet from overheating. Solutions to problems of that magnitude—real problems that we need great minds to solve—take the kind of complex understanding that can only come from people of many disciplinary tribes coming together in peace to make it happen.

The limits of disciplinary study are not a big secret, or even anything new; the value of crossing disciplinary boundaries to give new perspective to stalled research agendas, and/or to more effectively solve real-world problems, has been widely accepted for decades—by great names in science from Norbert Wiener, Werner Heisenberg, and Thomas Kuhn, to more recent practitioners such as E.O. Wilson and Leroy Hood.

More practically, Rita Colwell, the director of the National Science Foundation—the American federal agency responsible for spending $3.3 billion on research projects annually—has declared interdisciplinarity to be a critical component in NSF funding decisions.

Nor are the shortcomings of disciplinary science surprising to mere mortals, who often have cause to marvel at the fact that they can go to several different medical specialists about the same problem, for example, and nary a one knows anything of the others' work—or if they know it, has anything but disdain for it.

But most researchers, and particularly "hard" scientists who have often dedicated their lives to studying the most remarkably arcane arcana, often have no intuitive sense of the wisdom of learning what other smart people are doing. For them, when higher water floats more boats, it's just harder to get out of the harbor.

So although it's kind of silly in light of proven benefits, it's not terribly surprising that hardly anyone actually practices interdisciplinarity, even though so many claim to.

Particularly it's not surprising because everything in today's university system works against it: Tenure is granted on the basis of specialization and achievement in a chosen discipline. The journals with clout, where you absolutely must publish to be considered for tenure, are all relentlessly disciplinary. The all-important departmental funding—and often individual project funding—is largely based on disciplinary achievement.

So there is no reward structure for crossing disciplines, either financially or professionally. In fact, you are often punished if you look outside your discipline for inspiration or, God forbid, for research partners; you're regarded as not "serious" about your work.

Then there are the personal barriers to practicing interdisciplinarity, the psychological issues of trust and fear and the marked distaste that most disciplinarians have for living with the kind of ambiguity that interdisciplinary work presents, not to mention the lack of a common language between disciplines.

The final straw for those steeped in quantitative science: There are no metrics or accepted methodologies for doing or measuring the results of interdisciplinary work, or even much sense of what kinds of problems it works best on.

What, Then, Shall We Do?

How to get researchers to "be interdisciplinary" is a big, live-wire kind of problem with the potential for lots of unintended consequences. Building an organization that asks researchers to practice this—which in their minds, may mean risking their careers, even though it could yield a Holy Grail—was something we knew would require a methodical, considered approach.

We decided to use Hybrid Vigor to explore both the process and the content of interdisciplinary research. Our organizing principle would be a compelling common topic already under study by widely various disciplines.

We have focused our energies on three areas where we can best explore these topics: Earth systems,

health determinants, and human perception—as well as interdisciplinary practice itself.

Earth systems, health determinants, and human perception are rife with problems to address. No single discipline commands the field in these areas, but great near-term progress is clearly possible, and researchers in these areas have a great many useful things to tell one another.

Interdisciplinary practice focuses on analyzing and evaluating how this type of research is best conducted, employed and assessed. We plan to design metrics for interdisciplinary work: ways to measure it, judge it, and improve it.

We're creating a new mode for organizing scientific research. It might be called a network-based Roman forum. It lets researchers interact in a novel way, at their own comfort level, outside of the university system, with Hybrid Vigor as their trusted agent.

The forum has four components:

- *A quarterly journal.* We're gearing up to publish four journals or monographs this year, via the Internet and the World Wide Web. Each issue will address a topic in one of our program areas. This will bring researchers from different disciplines in contact with each other's work. (Eventually we'll publish sixteen per year, four in each program area.)

  Although targeted at researchers, each journal will be written for a general yet sophisticated audience, free of the disciplinary jargon that often immediately alienates a potential boundary-crosser. As one of our editorial advisors said, "All scientists are laypeople when they're outside their home discipline."

- *Working conferences.* Next year, or later this year if funding permits, the Institute will begin hosting an ongoing series of invitation-only working conferences. They will be organized around single, specific topics, for small groups of established researchers and graduate students from a range of disciplines.

- *Hybridvigor.net.* Traditionally, cross-disciplinary researchers face two very difficult tasks: finding fellow travelers outside their chosen disciplines, and gaining access to their work. Our membership network for researchers will unite them, equip them with new tools, and also compile a database of their relevant publications. The goal here is to automate serendipity.

- *Post-doctoral fellowships.* This final component will team post-docs with tenured professors for intensive, two-year forays outside their chosen disciplines. By bringing fellowship money for interdisciplinary work into the existing, often hostile, departmental bureaucracy, we can influence the system from the inside.

We want results, certainly. But we also plan to produce the conditions which produce results—to bring people together with each other, and with information, in a way that encourages them, and rewards them for thinking outside their fields.

We're outsiders, but this is our critical advantage. We have no baggage, no crosses to bear, no axes to grind. We are a disciplinary Switzerland—neutral in a land of warring fiefdoms and battling bureaucracies.

We did consider allying with universities early on—or, more to the point, some of our early funders did. But our academic friends and advisors warned us off.

Universities simply don't exist for this purpose. Interdisciplinary projects cost more, take longer, are hard to measure, and require a high level of ambiguity. Inside a university system, we'd either have our metabolism slowed to one degree above death, or we'd be surrounded and destroyed wholesale by the bureaucracy's antibody response. Many university-based interdisciplinary projects have paid this price in the past.

By staying independent, we can't be expelled, because we aren't a body part. Yet we can provide great benefits to all involved, without taking one dollar or one researcher away from their required disciplinary work. In fact, we might even be able to give the system a little cash ourselves.

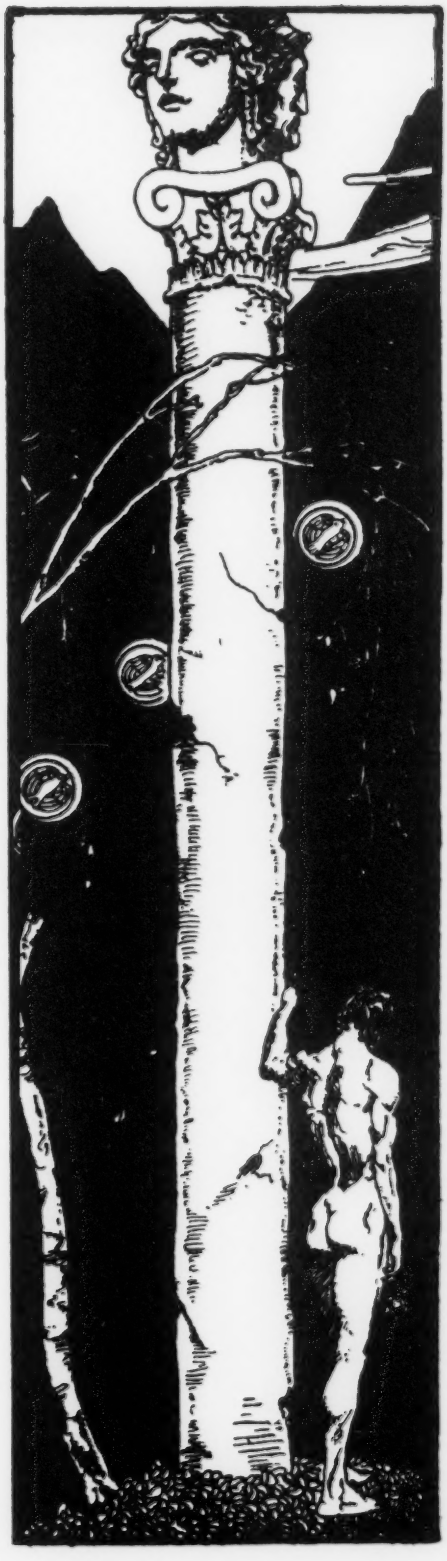
At the end of the day, we'll measure our own effectiveness by our ability to pull thousands of researchers around the world into our net. Eventually, they'll be lured there, by our models and metrics and fresh new thinking about integrative research.

Our goal is to establish best practices, financial incentives, and a new kind of reputation—capital for crossing disciplinary boundaries in tomorrow's densely networked world.

We are convinced that when and if this happens, it will be the start of a new knowledge ecology —a way to produce knowledge that connects, rather than protects, information. On this path to complex understanding and the creation of enduring impact, we will celebrate the primal urge behind science: that delicious ambiguity of not knowing...yet.

Fuse Foundation

by Alex Steffen



Decades ago, in the first *Whole Earth Catalog,* Stewart Brand put forward this challenge: "We are as gods. We might as well get good at it." At the time, it may have seemed hippie hyperbole. Now it is a bald statement of fact.

We live in a world where engineering new life is becoming commonplace; where the seas are rising and the forests disappearing; where shipping containers, waves of refugees, and viruses stream back and forth across borders; where in a thousand ways the continuity of the past with the future has been shattered. We humans are no longer the people of yesteryear. This planet is not the planet on which we evolved. Our corporatized, mediated, post-civic lives have little to do with that Enlightenment world that gave us the Declaration of Independence, the Declaration of the Rights of Man, and *The Wealth of Nations.* As Yeats wrote, "the falcon cannot hear the falconer," as Marx wrote, "all that is solid melts into air," and the world into which we were born has vanished.

This new world in which we live is a mystery to us. How do we come to grips with our profound ability to shape and reshape the world and the human condition? It is a question that we find ourselves unprepared to answer. In such a situation, it's no longer a luxury to ask the old artistic oraculars: Who are we? Where are we going? What do we want?

That's where we at Fuse Foundation come in. Our mission is to promote cultural engagement with the deep, complex challenges of our day. We've found one of the best and simplest ways in which to do this. We promote the careers of extraordinarily talented emerging cultural innovators.

The temptation to preach is great these days. The injustices of our world are profound. We've all seen those "if the world were a village" analogies, yet somehow we remain unable to connect with reality. Utter destitution, with starvation, disease, homelessness, and despair is more the rule than the exception in many places. The world is rapidly becoming an extended Brazil of wealthy jet-set elites gazing down over vast seas of common people caught in some awful upgrade of the Industrial Revolution, replete with sweatshops, child labor, and poisonous yellow fogs over sprawling shanty-cities. Tyranny, war, genocide, slavery, famine, child prostitution, plague: all are growth industries across vast swaths of the planet. Meanwhile, the West seems lost in its own fog of strip-mall communities, bubble economies, and tabloid culture. We are in bad shape, here at the dawn of the twenty-first century.

But none of this litany excuses the making of bad artwork. Let's call everything from painting and dance to film and creative journalism "art" for the sake of brevity, and not get hung up in definitions. Effective art is transformative, it remakes our vision of the world. Art works best when distinct from political preaching. We don't seek to fund "political art." The art of slogans, and slogan-like thinking is frankly ineffective to our ends, because it's poorly crafted and lacks emotional resonance. Art works best on its own, different level. It does its work down in our guts. It, as Henry James wrote, "speaks to that part of us which is a gift and not an acquisition."

The heartfelt need not be simple. But even when simple and direct, the heartless is dead. "A poem should be an axe for the frozen sea within," said Kafka. The metaphors, delivered though they may be in a wrapping of intellectual velvet, are as hard and real as a piece of slate. Even erudite, learned art grasps us best when we can sense that power running beneath the surface.

Artists need now to understand in their very bones Joyce's injunction that "the writer can be God, but he cannot be a preacher." It's part of the artist's work to construct whole, convincing worlds which illuminate the

situation of the audience in some intentional way, but it is never his or her right to preach at them.

Unfortunately, though most political art is bad, apolitical art is not necessarily good. There is certainly plenty of apolitical art in our day—cloying stuff, focused to the smallest degree on the artist's private obsessions; monuments to ego and missed therapy sessions. Why would we want to support this work? Why would we want to encounter it?

There are true masters in the art world, laboring hidden in the deep woods, high mountains, rusting warehouses and small-town garages. The Buddhists of Japan say that the *san-nin*, mountain sages of great age and wisdom, eat hail and drink mists and fog. These worthies are perfecting their visions and mastering their crafts to produce works that speak simply and plainly to the deepest questions of the human condition, while struggling as best they can to swat the dunce's hat of fame away. They are, of course, essential, and rare, and hard to find. But in Fuse Foundation, these wondrous people are not our problem. The MacArthur "genius grant" folks are already out there looking for them.

Emerging artists face a different situation. For creative people, the early years are critical. When an artist has mastered the basics of craft and technique, and is beginning to push the boundaries of meaning and purpose, he or she often begins a period of rich and fertile work. This is also usually the time when the artist is trying to figure out how to survive. It is here that many inspired, talented people waste years of effort, or just give up altogether. If you doubt how critical this time can be, go find one of those established masters and ask him about his own early career. He will almost surely tell you a story about a key donation, a timely patron, a lifechanging grant, an editor who took a chance—some crucial piece of support that, by arriving at the right time, not only made it practical for him to go on as an artist, but also gave him the courage to do so.

These days, that kind of help is hard to find. Funding from public agencies, such as the National Endowments for the Arts and Humanities, has largely disappeared. Private foundations have not made up the shortfall. Academia rarely provides a nourishing environment. And the old system of artistic patronage is as dead as the debutante ball. Emerging creative innovators have few places to turn.

That's what the Fuse Foundation wants to change.

We provide lifechanging grants: grants which bring a substantial monetary award (up to $20,000), networking opportunities, technical assistance, survival skills training, and practical help with promotions and fundraising. Our artistic partners come to us showing obvious promise and extraordinary vision. They leave with work that speaks for itself and the know-how to make a career in the arts.

We're also connecting new patrons and emerging philanthropists with emerging artists and arts groups. Artists sitting alone together in a room will not transmute the cultural conversation—to have a truly transformative effect, they need to be connected to patrons, supporters, audiences, and critics. We're trying a number of approaches to doing just that.

Finally, we're working to provide emerging artists the opportunity to meet other folks-elected officials, scientists, activists, journalists-who are similarly engaged in the deep transformation of society. We want to see if they can learn from one another, if they can form themselves into a network which has the capacity to help us understand what it means to live in this strange day of ours.

Ours is a terrifying and a beautiful period of history. Look for visions which matter, which speak to your heart, which grab you deep in the ganglia and send the shivers running out through your fingertips. And when you find them, hold on to them, and do all you can to support the folks who made them. We'll all be needing their brilliance soon enough.

Alex Steffen (steffen@fusefoundation.org) is president of the board of directors of the Fuse Foundation in Seattle.

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The Fuse Foundation does not accept unsolicited applications for its Partner Program. Applications are taken only from candidates put forward by a member of its anonymous nominating committee, which is composed of prominent cultural innovators and civic leaders.

DNA for a Conservation Economy

by Stuart Cowan

Stuart Cowan, a native of Vancouver Island, serves as the conservation economy research director at Ecotrust, in Portland, Oregon.

I grew up in the heart of the 2,000-mile-long coastal temperate rainforest stretching from Big Sur, California to Kodiak Island, Alaska. My hometown on Vancouver Island was a quintessential resource town, built on salmon, forests, and minerals.

During the summers, camping trips would take us past lunar clear-cuts and abandoned logging equipment, scars from an extractive and volatile economy. The salmon that once fed my family year-round are now endangered; the old growth mainly gone; the mines outcompeted by cheaper labor costs and minimal environmental safeguards half a planet away.

I am haunted by a hundred-year-old photo of a Kwa'kwa'kwa woman. She is wrapped in elegantly decorated cedar-bark garments. She is gathering clams on the tidal mudflats, not far north of my childhood home, even as the diseases of contact decimate her people and legal shenanigans shoehorn their land into arbitrary reservations.

Her grandparents lived in a complex biocultural mosaic, from the Alutiq and Tlingt to the north to the Pomo and Wappo to the south. The coastal Northwest bioregion was filled with dozens of distinct cultures and languages, some dating back 10,000 years, holding a wealth of story, art, and ritual. These were cultures of permanence, predicated on an intimate knowledge of local ecosystems.

During the next few decades, this bioregion, like others across the planet, faces a design problem. As Version 1.0 of the industrial economy loses its social mandate—as its cultural and environmental costs become insupportable—what shall we replace it with? How can we grow a post-extractive conservation economy that honors culture and place; restores landscapes and stabilizes ecosystem services; enhances social equity; and provides diverse, meaningful, and stable livelihoods?

A Japanese teahouse, an Italian hill town, or a New England commons are responsive to the particularities of their sites and users, yet have a built grammar of materials and geometry making them instantly recognizable. In the same way, a conservation economy in the Pacific Northwest, in the Colorado Plateau, or in the Amazon ought to be alive to place and culture, yet recognizable in its underlying structure.

Since the 1970s, Christopher Alexander and his colleagues at UC Berkeley and the Center for Environmental Structure have developed a powerful methodology for getting at the underlying structure of wholeness of buildings, neighborhoods, and cities. In their best-selling book, *A Pattern Language*, they present 252 patterns, ranging from "Light on Two Sides of Every Room" to "Window Place" to "Identifiable Neighborhood."

Each pattern is carefully described, justified, illustrated with case studies, and placed in the context of other patterns, providing grammatical glue to the language. More recently, pattern languages have been used extensively in the software industry.

Two years ago, I joined Ecotrust, an innovative nonprofit in Portland, Oregon, with the task of extending the rigorous pattern-language approach to the bioregional scale and social complexity of a conservation economy. Our team of web designers, database specialists, researchers, and writers identified dozens of candidate patterns and case studies, tested their relationships, and ultimately developed a draft conservation economy framework with sixty-two broad patterns (see Resources, page 35). Each pattern solves a recurring problem in a way that yields simultaneous ecological, social, and economic benefits.

The team relied significantly on the Natural Step (www.naturalstep.org) system conditions for sustainability; drew on disciplines ranging from conservation biology to industrial ecology; and examined technologies spanning hydrogen fuel cells and Geographic Information Systems (GIS).

The conservation economy framework includes patterns like "Natural Capital and Ecosystem Services"; "Resource Efficiency, Product Labeling and Certification"; "Phasing Out of Toxicity"; "Product as Service"; "Connected Wildlands"; "Sustainable Agriculture"; "Awareness of Consumption and Its Effects"; "Community and Civic Society"; and "Cultural Preservation." Each pattern is succinctly described, illustrated, and linked to other patterns, case studies, and organizations.

Following the example of the Linux operating system, Ecotrust is hosting the conservation economy framework as "open source" software. The entire text of the patterns, with all supporting documentation, is available for free on the "Patterns of a Conservation Economy" website (see Resources). Anyone can critique or suggest a pattern, nominate case studies, or add references. The editorial team has already received a steady stream of valuable feedback.

The framework serves as a visual and conceptual template for organizations, towns and cities, or regions as they develop coherent long-term strategies for joining the conservation economy. It provides a filter, delineating all of the significant areas of activity in the emerging conservation economy, and thereby suggesting a coherent portfolio of activities. Patterns are inherently fractal, and can be refined as necessary.

As a pattern language evolves through testing and dialogue, it provides an accurate record of joint agreement and shared vision within its community of users. The conservation economy framework helps to create a shared mental model that allows for clear

communication and effective action for all parties involved. Because patterns reflect the structure of wholeness in the world, they can serve as functional nodes for management, budgeting, and communication purposes.

Ecotrust is committed to a conservation economy on multiple levels. Along with conservationeconomy.net, it hosts a bioregional news service (www.tidepool.org) and a bioregional information system (www.inforain.org). It is completing the renovation of a turn-of-the-century warehouse in Portland's Pearl District into the Natural Capital Center, a 50,000-square-foot green building with tenants including ShoreBank Pacific (an environmental bank that Ecotrust cofounded), Portland's Office of Sustainable Development, Progressive Investment Management (with its Portfolio 21, a mutual fund positively screened for sustainable companies), and the Certified Forest Products Council.

In addition, Ecotrust offers GIS mapping services and maintains a number of field representatives throughout the bioregion in a unique partnership with a green revolving loan fund called Shorebank Enterprise Pacific.

With the completion of a conservation-economy pattern language transferable throughout the bioregion, Ecotrust has begun to work on its local implementation with a variety of partners. The Institute for Sustainable Ethics and Economics in Eugene, Oregon is adapting the framework as a tool for scenario building (face-to-face) and community visioning/benchmarking (web-based) at the scale of Lane County. The town of Silverton, Oregon (population 6,000) is using the pattern language as part of its mandatory comprehensive plan update. A consortium of universities and government agencies in Canada and the US is linking the pattern language to a sophisticated GIS for the Georgia Basin region around Vancouver, B.C.

Great obstacles remain. A tightly linked system of sixty-two patterns does not lend itself to easy explanation. On the other hand, the transformations required to enter a conservation economy cut across every aspect of society. They will be contested and misunderstood every step of the way.

After years of research, I am convinced that a conservation economy is both desirable and feasible. Our work is to create an open forum where this possibility can be transparently debated and incrementally refined—and to create associated implementation tools. This is a small step amidst much other encouraging activity throughout the bioregion. We hope you will join us in hacking this open source DNA for a Viridian future.

Conservation Economy Resources

Ecological Design
Sim Van Der Ryn and Stuart Cowan
1995, 200 pp.
$21.95
Island Press

A Pattern Language
Towns, Buildings, Construction
Christopher Alexander, Sara Ishikawa, and Murray Silverstein
1977; 1171 pp.
$65
Oxford University Press

Patternlanguage.com
www.patternlanguage.com

Metropolitics
A Regional Agenda for Community and Stability
Myron W. Orfield and David Rusk
1998; 224 pp.
$18.95
Brookings Institute

Patterns of a Conservation Economy
(Hosted by Ecotrust)
www.conservationeconomy.net

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1200 Northwest Naito Parkway #470
Portland, OR 97209
503/227-6225
info@ecotrust.org
www.ecotrust.org

The Natural Step
The Presidio
Thoreau Center for Sustainability
PO Box 29372
San Francisco CA 94129-0372
www.naturalstep.org

ShoreBank Pacific
PO Box 400
Ilwaco, WA 98624
877/326-4326
www.eco-bank.com
ecobank@sbpac.com

The Natural Capital Center
721 NW Ninth Avenue
Portland, OR 97209
www.ecotrust.org/programs/natural_capital_center.html

The Literary View

Begins on page 36

communications prosthetics:

Threat, or Menace?

by Neal Stephenson

I was talking recently to a novelist friend who doesn't get out much, and who (like most of our breed) likes it that way. But after a decade or more of working by himself, he had taken a temporary job that involved working with fellow human beings (FHBs).

I asked him how it was going. He seemed uncomfortable. No, no, the people were just fine, he insisted, and he loved the project. But something was bothering him.

"Neal," he finally said, "have you ever heard of this thing called...a Powerpoint Presentation?"

I confessed that I had. But this was no time to strike the pose of Mr. Cool, man of the world, been-there-done-that. I needed to let the poor guy ventilate. He was traumatized. Confronting the reality of Powerpoint was a moment of pure existential horror for him.

I was able to talk him out of his funk with the following rationale: outside of the tiny, cloistered world of novelists, most people have to work with fellow human beings. Which means communicating with them. But communicating with FHBs is hard. Some can do it by drawing pictures, others by interpretive dance, oratory, cinema, or sonnets. But some can't. Thus Powerpoint. To people who can't communicate, it is what the dialysis machine is to people who don't have kidneys.

In truth, I just made this up on the spur of the moment to talk my friend down off his existential ledge. But since then I have begun to notice other Communications Prosthetics (CPs). They show up most often in the business environment, so crowded with people who can't discharge their responsibilities without communicating with FHBs.

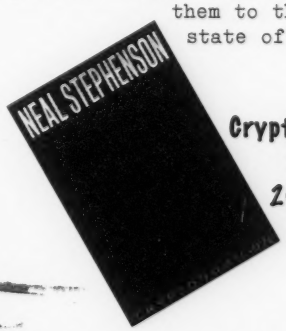
I suspect that the whiteboard is also a Communications Prosthetic. It does the same thing as a plain old-fashioned chalkboard. But its noisome pens spew xylene fumes into the air, bursting small blood vessels in the eye, dissolving mucous membranes, triggering migraine headaches, and making everyone giddy and out of focus. A used-up, dried-out pen cannot be distinguished from a fresh one until you pick it up and try to write with it, whereas from ten yards away you can tell how much chalk is left in a piece of chalk. The only thing that the whiteboard has going for it is spurious New Economy sleekness, and more vivid colors in which to scrawl inane bubble diagrams.

To paraphrase the old saw about pornography, I can't define what a CP is, but I know it when I see it. Every English teacher who has read a poorly structured student essay that employs twenty-five different typefaces in four different colors, every web surfer who has gotten lost in a flashy commercial website, every

recipient of an Internet greeting card (or a paper one, for that matter, everyone who has tried to make sense of a brochure cluttered with clip art, or to get work done using a Kafkaesque graphical user interface, knows.

CPs are about abdication of judgment. If you are writing a document on a manual typewriter, you are forced to make choices. If you are penning a sonnet in Elizabethan London, you must think very hard before you touch your ink-laden bird feather to that sheet of expensive paper. If you are trying to get 100 musicians to play your symphony, you had better have your ducks in a row before you walk into the hall with an armload of scores. If you are turning a huge block of marble into a sculpture, you'd best know exactly what you are about before you let fly with that hammer. But in the world of CPs, paper is free, musicians are synthesized robots who never complain, and blocks of marble are endowed with unlimited Undo. It creates the illusion that the nasty, old-fashioned requirement to make all those damned choices has been done away with.

The only fly in the ointment is t h a t we have not yet been able to create a digital audience. If you were talking to a digital audience, and noticed that they had, in the last few moments, become hopelessly confused, you could just hit Undo a few times and restore them to their previous state of mental clarity.



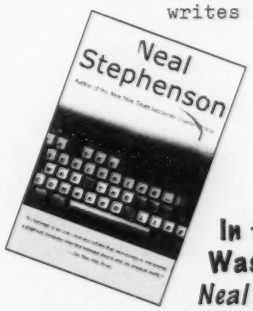
Cryptonomicon
Neal Stephenson
2000, 918 pages
$16
HarperPerennial

Terminally confused audiences could be dragged to the Trash and replaced with fresh ones. But as matters stand, we must put up with the same analog audiences that Shakespeare wrote plays and Beethoven wrote symphonies for: audiences that can't be Trashed and that throw tomatoes at you when they are unhappy.

The trend is not all bad, however. A while ago I got a cellphone endowed with the ability to receive text messages. But there was a limit: each message could be no more than a couple of hundred characters. What good was such a thing? After some playing around, I found that most haikus were short enough to sneak in under that limit. Now I'm thinking about a perl script that would monitor all of my incoming email and reject all messages that were not correctly formatted haikus. It would get rid of long-winded messages, and filter out spam too. Most spam, anyway….

Internet Sherlock
Learn your enemies' secrets
Banned in fifty states.

Neal Stephenson is a digital design critic from Seattle. He also writes novels.



In the Beginning... Was the Command Line
Neal Stephenson
1999, 151 pages
$10
Avon Books

METROPHAGY

the art and science of digesting large cities

by William Gibson

Literary forms are tools, and genuinely new ones are few and far between.

I believe that Peter Ackroyd has invented a genuinely new one with *London: The Biography,* although I would hesitate to give him sole credit for the perfected form.

There has been a vast, multi-authored, peculiarly specific "London Project" rather cryptically under way for the past decade or so in London, and Ackroyd of course has been central to that, with works like *Hawksmoor, The House of Doctor Dee,* and *Dan Leno & the Limehouse Golem.*

But these books arise from a substrate of more singular and less popularly visible literature: from Iain Sinclair's poetry (*Lud Heat, Suicide Bridge*), novels (*Down River, Radon Daughters*) and superbly hallucinatory London-based nonfiction (*Lights Out for the Territory*), and from the obsessively detailed graphic-novel Ripperology of Alan Moore's *From Hell.* (Somewhere deep at the heart of all of this accumulated new-wave Londonology dwell the tygers and angels of William Blake, himself an artificer of what we would call "graphic novels," were they to be produced today.)

These are all works which attempt to reBraille the Borgesian labyrinth that is London and its history, while regarding that retouching, that induction of the "return of the reforgotten," as an heroic and somehow utterly crucial project in and of itself.

I have been a keen visitant to this London Project almost from its start, as the enigma of this mysteriously "unknowable" city has been with me since I first went there in my early twenties. The paradox of this vast human settlement, this text laid out in the one human language I have immediate and effortless access to, yet which remains somehow resolutely "closed," has troubled me quietly and constantly, and I have returned there more repeatedly, and more determinedly, than to any other world city. Looking, always, for some key, some Rosetta Stone.

I began to find that key, it seemed, in the nineties, in Iain Sinclair's work, with its weird cod-occult forays into urban ley-lines and secret centers of ancient and nameless power. Sinclair's almost autistic vision cut down into the very magma of the thing, providing handles for what had previously seemed unimaginable, unmanageable.

But Sinclair's faux-Lovecraftian subtexts, like Moore's blood-drenched conspiracies in *From Hell,* finally lose traction in the way that all conspiracy theories do: the description of an underlying, literally occulted order is invariably less complex than the surface reality it supposedly informs. Conspiracy theories and the occult comfort us because they present models of the world that more easily make sense than the world itself, and, regardless of how dark or threatening, are inherently less frightening.

The Difference Engine
William Gibson
and Bruce Sterling
1991; 430 pp.
$6.99
Bantam

London, 1855. Charles Babbage perfects his Victorian computer, and an Information Revolution arrives a century ahead of its time. —BS & WG

All Tomorrow's Parties
William Gibson
2000; 277 pp.
$13.95
Ace Books

Colin Laney lives in a cardboard box, but he can see "nodal points" in vast streams of data. —BS

Cracking Codes
The Rosetta Stone and Decipherment
Richard Parkinson
1999; 208 pp.
$27.50
University of California Press

From London, the British Museum's assistant keeper of Egyptian antiquities delivers the latest word on hieroglyphics —BS

Low Life
Lures and Snares of Old New York
Luc Sante
1992; 414 pp.
$16
Vintage Books

Ackroyd, in *London: The Biography*, quite resolutely resists that, while continuing to generate a subtle and spooky and to my mind entirely genuine sense of the way that, when we examine London, we draw close to thrones and dominions—and not of the most obvious sort.

Each of the book's seventy-nine chapters functions as a core drill down into an extraordinary wealth of narrative, of voices, each chapter an exploratory essay assembled under a given rubric: women, riots, drunkenness, sacred sites, food, entertainments violent and otherwise, jails, music, plagues, murders, electricity, clocks, magic, lost rivers, the underground, the homeless, trees, the suburbs....

It is this simple structure that I believe constitutes a new form, as I know of no other work of urban history that functions in quite this way, or that delivers what this book delivers. Luc Sante's *Low Life* comes to mind for New York, and Edward Seidensticker's *Low City, High City* for Tokyo, with Seidensticker perhaps coming closest to Ackroyd's accomplishment here: the presentation of a city's wholeness and fractal history in the most purely organic terms. To possess this book, or rather to allow oneself to be possessed by it, is the closest literature can bring us to owning London.

And the London Ackroyd gives us partakes entirely of that from which it springs, so that we possess an "echoic" city, in which certain locales are subject to an ongoing re-looping of narrative, as when today's homeless shelter sits beneath the very church eaves that sheltered the homeless of centuries ago. It is a city in which, he suggests, subjective time flows differently, from one area to the next, and may have come to a near complete halt in others. It is a city in which the eternal suffering of the poor may perpetually serve some mysterious and driving purpose in the life of the whole, some hidden dynamo of torture and sacrifice dating back to something stranger and less easily articulated than the hungry ghosts of Hawksmoor.

These are not observations that one could arrive at using any previous literary model of metropolitan history, but the result of a genuinely postmodern agenda, an entirely new and utterly compelling way to write about cities.

If you wish to possess the world's greatest city, read *London: The Biography*. If you would learn to expose the soul of a place, in the deepest and most thoroughly contemporary way, read it again.

William Gibson is a world traveler with an honorary doctorate in design. He also writes novels.

Hawksmoor
Peter Ackroyd
1993; 224 pp.
£6.99
Penguin
(out of print in US)

The House of Doctor Dee
Peter Ackroyd
1994; 288 pp.
£7.99
Penguin
(out of print in US)

Dan Leno & the Limehouse Golem
Peter Ackroyd
1995; 281 pp.
£6.99
Minerva
(out of print in US)

London
The Biography
Peter Ackroyd
2000; 824 pp.
£25.00
Chatto and Windus
www.amazon.co.uk
Scheduled for US publication (Doubleday) fall, 2001

The Best of H.P. Lovecraft
Bloodcurdling Tales of Horror and the Macabre
H.P. Lovecraft, introduction by Robert Bloch
1987; 406 pp.
$10
Del Rey

Man in his unseeing ignorance shall rupture the air and oceans with fire, and cover the firmament with the venomous shroud of ancient Cthulhu's shadow. Or so they say. —BS

William Blake
The Complete Illuminated Books
William Blake, introduction by David Bindman
2001; 480 pp.
$39.95
Thames & Hudson

Labyrinths
Selected Stories and Other Writings
Jorge Luis Borges
1988; 313 pp.
$11.95
W.W. Norton & Company

From Hell
Alan Moore, art by Eddie Campbell
2000; 572 pp.
$35
Eddie Campbell Comics

Considered to be Alan Moore's masterpiece, with some of perfect collaborator Eddie Campbell's finest illustration. —BS

Lights Out for the Territory
9 Excursions in the Secret History of London
Iain Sinclair
1998; 386 pp.
$16.95
Granta Books

Radon Daughters
Iain Sinclair
1998; 459 pp.
£6.99
Granta Books

Low City, High City
Tokyo from Edo to the Earthquake
Edward Seidensticker
1991; 302 pp.
$14.95
Alfred A. Knopf

technology: THE BITCH GODDESS

BY JOEL GARREAU

Joel Garreau writes about culture for *The Washington Post*, studies urban policy, writes best-selling books about the infrastructure of America, and has been on over a thousand TV and radio shows. And just look at the galaxy of pundits Garreau quotes in this painfully accurate article! This guy has got a Rolodex the size of a head of cabbage.

For almost as long as the average American has been alive, people have been driven nuts by the flashing "12:00" of their videocassette recorder's clock.

That flashing "12:00" has become a symbol of technology as tyranny, taunt, impotence, ignorance, intimidation, humiliation, stone in the shoe and pain in the butt. It stands for innovation created without humans in mind. Yet humans have grown to live with it. To expect it. To adjust themselves to the selfishness of these machines. Like sheep.

Consider the most recent twist of the knife. Some twenty-five years late, the electronics industry promised to solve the flashing-12:00 problem. Today, most new VCRs are supposed to seek out a broadcast time signal and set their own clocks.

Except when they don't.

"About three weeks ago, the time went precisely one hour ahead," reports Linda Busche of Logan Circle (the District of Columbia). "Then it set itself back to the right time. I walked in and

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said, 'Oh, it's gone back to the right time; wonder how that happened.' This past week, it's flipping out and is four or five hours behind. It's just weird."

In Stafford County, Virginia James Han's VCR "has developed a bad attitude. It would suddenly clear whatever time was shown, shut down and even turn off the power."

"Mine keeps giving me a message saying it couldn't find a channel with the time," says Anne McDonough of Alexandria, Virginia. "My cable has 120 channels. It just doesn't make sense. Isn't technology wonderful?"

The future, say inventors at the bleeding edge, is ever-newer products that have not been tested, help desks that won't answer the phone, and manuals not written in recognizable English.

And that's just the way it will continue, the digerati ruefully acknowledge.

Forever.

Well, maybe not forever. "A couple of hundred years," says Danny Hillis, the Silicon Valley visionary who developed what is known as the massively parallel supercomputer. "This is not a normal state of human history. It's especially rough if you only live eighty years. But that's nothing in historical terms."

For more than three decades, computer power has been doubling and redoubling in a steep geometric curve, heading toward a 2030 in which savants believe processors will be as ubiquitous as light bulbs—embedded in everything from earrings to soup cans—and computers will be one million times more powerful than they are now. Yet users will still be cursing the whole overwhelming, gushing, surging lot, they say.

For this is a world fundamentally different from the twentieth century. In that simpler age, older technologies—cars, televisions—might have been full of glitches when they first appeared. But eventually they reached a stable plateau of convenience and standardization. Improvements—power windows, color programming—caused new problems. But at some point an exemplar like the Honda Accord emerged as the symbol of a stable, mature, blooper-free product.

Such plateaus are no longer in sight—for centuries.

For every innovation that has become an effortless part of people's lives—the microwave oven, the fiber-tip pen—there are hundreds of new technologies every year arriving faster than users can assimilate them or their makers can perfect them. Now a line has been crossed. With gizmos mutating at wild rates, engineers love the endless stomach-churning ride of creating the firstest with the newest. They've dragged us along with them. We're climbing a slope of interlocking innovations so steep as to seem more like a cliff: Connections that won't, upgrades that can't, hot syncs that don't, standards that never are, wireless transmitters radiating who knows what, new seeds and life-forms burrowing in the ground and whisking through the air.

There will never be a safe plateau on which to rest and regroup in our lifetimes, these pundits say.

"Technology is treated as something that pushes us around rather than something we create," writes Internet pioneer Stewart Brand in *The Clock of the Long Now*. "It's a bother, it's a boon, it's a discipline, it's a given."

Computer designer Hillis says, "What people mean by the word 'technology' is the stuff that doesn't really work yet."

Pandora's Toys

The plateau may not be the natural state modern minds think it is. Ancient myths have a lot to say about this dilemma.

Hephaestus was the Greek god of fire and crafts, which is to say technology. Tellingly enough, he was born lame. His greatest creation was Pandora. Hephaestus sent her—at his father Zeus's request—to plague mankind. She was beautiful. But she sought knowledge. So she opened up a box that had been entrusted to her. Out leapt the plethora of ills that afflict humanity. All that was left inside was hope.

Curiosity's unintended results continue to resound. The nineteenth-century philosopher William James noted: "All our scientific and philosophic ideals are altars to unknown gods." James called our striving for success "the bitch-goddess."

"The moral flabbiness born of the exclusive worship of the bitch-goddess Success."

—William James, Letter to H. G. Wells, 11 Sept 1906

Technological success is the bitch-goddess of the twenty-first century, Hillis says: "This will be the infinite tease. Since every new possibility creates more possibilities, we will always be in the position of having most of the possibilities unrealized. The shift will go from hardware to software to wetware—mostly in biotech. Trial and error in biotech. Oh, yeah. You're already beginning to see it." (Think Frankenfoods.)

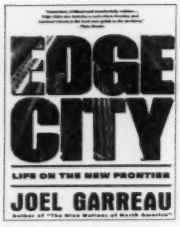
"You can't opt out" of this dance with the goddess, says Pamela McCorduck, an author on technology and society.

"This dance promises great things and delivers frustration. A computer becomes a hole in the desk into which users pour time. The Help button is the most worthless one on the keyboard. Things never go right—and it's always your fault. Nonetheless, these gadgets are invading everything. The Mercedes S-Class has sixty computers.

"No company exists that has said no thanks to technology," says McCorduck. "The New York City Department of Welfare believes its clients must have a telephone. This isn't really delusional. It's survival. Which is never a day at the beach."

Impossible to Communicate

A verbatim tale of sacrifice to the goddess:

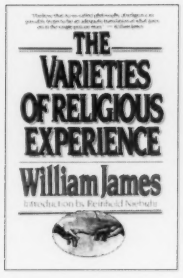


Edge City
Life on the New Frontier
Joel Garreau
1992; 548 pp.
$16.95
Anchor

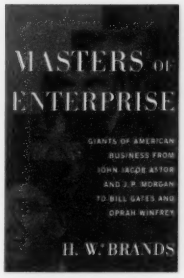
The Pattern on the Stone
The Simple Ideas That Make Computers Work
Daniel Hillis
1999; 164 pp.
$12
Perseus

When Things Start to Think
Neil A. Gershenfeld
2000; 225 pp.
$14
Owl Books

The Clock of the Long Now
Time and Responsibility: The Ideas Behind the World's Slowest Computer
Stewart Brand
1999; 190 pp.
$13
Basic Books



The Varieties of Religious Experience
William James
1997 (reprint ed.);
416 pp.
$8
MacMillan



Masters of Enterprise
Giants of American Business from John Jacob Astor and J.P. Morgan to Bill Gates and Oprah Winfrey
H. W. Brands
1999, 354 pp.
$26
Free Press

"Back in August we started checking into a DSL line," emails Jean Broadway of Arlington, Virginia, referring to the high-capacity Internet connection technology that, according to Gartner Dataquest, is doubling in home use every six months. "We found that Verizon couldn't provide one to us, but supposedly CapuNet could. I knew someone who used them and said it was great.

"So we started the process in September, finally getting the paperwork and faxing it to them in mid-October. Part of that slowness was us. But from then on it was all them.

"It was almost impossible to communicate with a real person, but through voice mail and email, they said they could provide us with a DSL line. They said Verizon would have to come out and do some work on the line, and then a tech from Covad, some company that CapuNet gets to do their tech stuff, would come out and do the rest. So we waited and waited. Someone from Verizon was supposed to come out Election Day, but perhaps because the stars were so out of alignment that day they finally came on Friday. Said they'd done what they needed to do and left.

"Then I get an email a few weeks later saying Verizon is coming out. I emailed that they'd already been out and why were they coming back? No response. This time they came a couple of days early and worked on the line and said they'd talked to Covad and tested it and it was fine. Then nothing at all from CapuNet or Covad.

"Finally, I got a hold of a real person at CapuNet and they checked and said, oh yeah I was too far away and they couldn't provide the service. Now why couldn't they tell me that in the first place? And when were they going to tell me?

"So now tomorrow we're supposed to get cable modem service installed. We'll see.

"My other 'favorite' story is about how we went out and bought a new computer in the middle of all the DSL mess (partly because the new computer processor would be faster, and partly because it already had the Ethernet card needed for DSL). So it had Windows ME, which wasn't getting along too well with AOL. Now, I really can't decide who my least favorite people in the world are—Bill Gates or Steve Case—but it seems that when Microsoft was developing Windows ME (Millennium Edition) they neglected to speak to AOL and the result was that the drivers and other stuff were incompatible, so there are lots of error messages. Fun!

"Of course, the error messages don't say something like 'Oops! We forgot to make our software compatible with AOL's, so sorry.' It's usually of the 'Fatal error message' sort—your computer is going to crash and burn."

AOL wouldn't talk, but Microsoft said it is "aware of some incompatibility issues," is "committed to ensuring that customers have a great online experience," and some of it is AOL's fault.

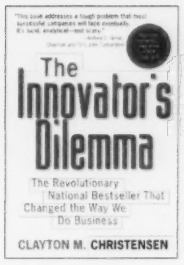
Spokesmen for Verizon, Covad, and CapuNet responded: "This technology has only been going on for two years; it will get better over time," and "DSL can be a complex installation; sounds like a lot of the technology that was supposed to work, didn't," and "success can't be guaranteed until installation is attempted."

Then they all groveled, and stressed their technology's fabulosity.

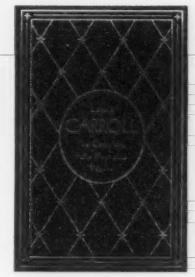
When it works.

Placating the Goddess

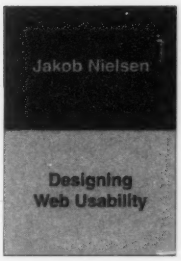
You can try to placate the goddess, to find your own private plateau, says Esther Dyson, the digital seer who is editor-in-chief of the revered industry newsletter *Release 1.0.*



The Innovator's Dilemma
Clayton M. Christensen
2000; 252 pp.
$16
HarperBusiness

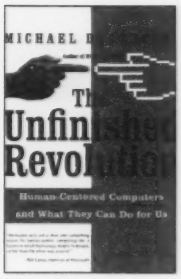


The Complete Illustrated Works
Lewis Carroll
1995, 868 pp.
$19.99
Grammercy



Designing Web Usability:
The Practice of Simplicity
Jakob Nielsen
1999; 432 pp.
$45
New Riders Publishing

The Inmates Are Running the Asylum
Why High Tech Products Drive Us Crazy and How To Restore The Sanity
Alan Cooper and
Paul Saffo
1999; 261 pp.
$25
Sams



The Unfinished Revolution
Human-Centered Computers and What They Can Do for Us
Michael L. Dertouzos
2001; 224 pp.
$26
HarperBusiness

"Don't upgrade all the time," she says. "If you've got something in the last three years, stop. It won't be leading-edge, but it will be working. In the end, the goal of any organization is not to be leading-edge, but to be effective.

"There's a fundamental conflict between the seller and the buyer of software. The buyer wants to make it work. The seller wants to make it half-work and improve it next year. The software business has an infinite capability for hype—for digital tail fins."

Amazingly, she says, "I'm not expecting a backlash. This is more like an unhappy marriage than a divorce. The buyers and the sellers are locked in this persistent embrace. But consumers should slow down, and increase the amount of improvement they demand."

The problem with slowing down, says Hillis, is what he calls the Red Queen Dilemma.

In Lewis Carroll's *Through the Looking Glass*, Alice finds herself running faster and faster, hand in hand with the Red Queen. "The most curious part of the thing was, that the trees and the other things round them never changed their places at all: however fast they went, they never seemed to pass anything . . . ."

"Still the Queen cried 'Faster! Faster!' and dragged her along." Finally they came to rest below the same tree under which they had started.

"'Well, in our country,' said Alice, still panting a little, 'you'd generally get to somewhere else—if you ran very fast for a long time, as we've been doing.'

"'A slow sort of country!' said the Queen. 'Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!"

The problem is that slowing down and keeping old gear means watching the rest of the world disappear over the horizon. A survey by Beloit College reveals that to college freshmen today, bottle caps have always been screw-off and plastic. "You sound like a broken record" means nothing to them. They have never played Pac-Man or Pong, have always had an answering machine, have never seen a black-and-white television, or one with only twelve channels, have always had cable, have always had a VCR, would not have a clue how to use a typewriter, can't imagine what hard contact lenses are, and cannot fathom not having a remote control.

"Still the Queen cried 'Faster! Faster!'..."

Washington to the Rescue?

To be sure, there is a tiny but growing host of consultants who want to believe they can beat the goddess.

The problem isn't a lack of understanding of the computer, says Avron Barr, a principal of Aldo Ventures, a Silicon Valley software industry strategy firm.

"Microsoft is among the best software shops on the planet," says Barr, "which is a frightening thought."

The problem, he says, is that software writers don't understand humans. "They still don't understand what kind of devices mothers would be able to use. Engineers want to make the neatest gizmo they can, as opposed to the simplest. So they put more tech in than mothers need."

Nobody actually sits down and watches a customer try to use this stuff, says Jakob Nielsen, author of *Designing Web Usability: The Practice of Simplicity*.

After enough planes crashed in the 50s, he points out, investigators stopped blaming it all on pilot error and insisted that designers start making cockpits easier to understand. You'd think we'd learn.

The enemy is us, says Alan Cooper, author of *The Inmates Are Running the Asylum: Why High Tech Products Drive Us Crazy and How to Restore the Sanity.* "Technology is going to continue to get worse as long as the buying public buys without a squabble, without protest," he says. "The techies find it easy to hide their guilt. They say you have to be computer-literate. They're wrong. Computer literacy is an excuse for techies to say, 'I don't want to actually have to think this stuff through.'"

Maybe the answer—gulp—is Washington. Perhaps the only way to create plateaus is to mandate them. That's what Jaron Lanier thinks. He's the computer scientist who invented the phrase "virtual reality."

There are three kinds of software, Lanier explains. The first is engineering software. It's the kind you find flying an Airbus jet. It's quite reliable, because it's designed to make a predictable machine do predictable things like take off and land. Therefore it can be tested thoroughly.

The third kind is creative software. It is dreamed up by people who fancy themselves artists, to push the boundaries of the human experience. "Let's say you wanted to create software so that kids can make music by wiggling their nose," Lanier says. The program may be buggy as a July barbecue. But if it is sufficiently intriguing, people will put up with defects because the new experience is thrilling.

The second kind is in between. It includes all your everyday business software, from email to checkbook manager. This is what drives us nuts, says Lanier. It never gets better, but it's not fun enough to be worth the endless hassles.

The market system is designed to reward whichever company pushes new stuff out the door first, observes Lanier. Waiting until you have a version that actually works is punished.

"Essentially, people are selling business software that is no more reliable than creative software," says Lanier. "It crashes all the time—it's totally unpredictable. There's not sufficient benefit to justify that unreliability. If each new version of Windows offered incredible ways of enhancing our lives, then we'd accept bugginess. But the current system, left to its own devices, will lead to eternal crap. I don't see any force in the current system that creates motivation to give people not-crap."

Here's where Washington comes in, Lanier says.

"What we should say is that copyright, like access to the airwaves, is something that brings responsibility. The government should give you copyright. But in exchange, you owe me a buck if your software crashes.

"There'd be different legal categories of software. If you want to rush it to market, and have first-mover advantage and see what happens, fine. You could label it creative software. But much of your code will be open to the public."

If you want to build a business empire, however, and you want the government to throw itself into protecting your copyrights, in Lanier's scheme you would then have to label your product "firmware."

"If you see this thing is taking off, you have the right to say: This is no longer creative software. This is functional. This has utility.

"But once you do that, you owe me a buck every time it crashes."

And the powers of Washington's enforcement tentacles would hound buggy software writers to the ends of the Earth.

"Instead of hunting down people who smoke pot, they'd be hunting down people who sell business software that crashes. They'd owe people a buck or go to jail. That's what Washington should be doing."

Need It And Weep

Michael Dertouzos is positive that techno-civilization will eventually plateau. He really is. He's the director of the Laboratory for Computer Science at MIT and the author of the new book *The Unfinished Revolution: Human-Centered Computers and What They Can Do for Us.*

His hope is all the more formidable because he believes that "if we have one ton of complex, frustrating, tear-inducing technology right now, we'll have 10 tons of manure within ten years. I kneel regularly and cry."

So why then is he an optimist?

Well, he deadpans, "because I am a Greek. And an American."

More to the point, he hopes a host of human-friendly design technologies are headed our way. Maybe they'll bring the machine to us, rather than us to the machine. Like how?

Voice recognition is a big one, he says.

Really?

Yeah, we've got stuff in the lab right now. Runs on a cheap desktop. As long as you keep your question narrow—like asking for the weather—it works great, he says.

What's an example?

Well, he said, the other day he wanted his computer to shut itself off. He said to it, "Goodbye."

So what happened?

Ah, well, it's still a laboratory system, he explains. It still needs a little work.

So what happened?

It responded by giving him the weather in Dubai.

Release 2.1
A Design for Living in the Digital Age
Esther Dyson
1998; 320 pp.
$14.95
Broadway Books

The Handbook Of Artificial Intelligence
Avron Barr and
Edward A. Feigenbaum, eds.
1982; four volumes
Out of print.

Instruments of Change
Jaron Lanier
1994; $7.99
POINT Music PolyGram
Dang good album, man. —BS

The Whole Earth Guide to Wiretaps

by Gail Thackeray

Gail Thackeray is the Special Counsel for Technology Crimes in the Arizona Attorney General's office. She has trained and assisted law enforcement groups around the whole Earth, including the US Secret Service, FBI, and IRS, and the Society for Worldwide Interbank Financial Telecommunications.

Wiretaps have proven international narcotics conspiracies and broken terrorist rings. They have convicted murderers and saved many lives. Wiretaps deliver evidence unobtainable by any other means. Yet as a society we view them with a certain queasy suspicion. We regulate wiretaps heavily, and endlessly debate the public policies that govern them. Wiretaps are the world's most intrusive investigative tool.

Contrary to the impression conveyed by Hollywood and the media, wiretaps are fairly rare. The vast majority of police officers and prosecutors go through their entire careers without ever working with one. Unless you or a close friend or relative are involved in a very serious criminal conspiracy, it is highly unlikely that you will ever be eavesdropped upon by the police.

Eavesdropping from your friends and neighbors, however, is another proposition altogether. Just walk into the neighborhood spy shop and see what's flying off the shelves. This ingenuity dates back to the early days of the telephone network. See, for instance, the 1918 case of State v. Beringer 10 Ariz. 502 (Ariz. 1918), in which an enterprising Arizonan placed a "dictograph" over the transom of a hotel room in order to spy on phone conversations. The Arizona Supreme Court found that conduct "most reprehensible," but, unfortunately, it was not in violation of an earlier state statute against tapping telegraphs. This was a classic case of a defendant getting off on a high-tech technicality. Obscure semantic distinctions are still very much a part of wiretap law today.

The basic rule defining eavesdropping is: Thou Shalt Not Intercept If Thou Art Not a Party. A "party" is a person speaking or being spoken to, or the sender or receiver of a fax or email. This means that you may not hook up a hidden tape recorder to your ex's phone, even if you yourself are paying for the telephone service. Nor are you to clone your coworker's voice mailbox. You shall not use a data sniffer to grab other people's keystrokes on the fly.

If a party consents to the interception, then it's not an "interception," it's just the recording of a message legitimately passed to a person meant to receive it. The federal rule and the rule of many states is "one party consent," though some states require consent from all parties. A legitimately recorded phone call is not eavesdropping. Police do not require a court order to listen to this evidence.

Thou Shalt Not Intercept If Thou Art Not a Party

Police do have to get a court order permitting interception without consent. Only certain prosecutors specified by federal or state law can apply for these court orders, and only certain courts may grant them.

Police must satisfy the court that they have all the probable cause necessary for a search warrant, and that they have exhausted other less intrusive means of investigation without success, or that it would be too dangerous to try them. Wiretap paperwork is detailed, technical, and in a complex case can easily run fifty to a hundred pages. Communications obtained in violation of the statutes cannot be introduced in court in any proceeding—except if the defendant has engaged in some illegal eavesdropping, in which case this can become legal evidence against him. (For this reason, your secret tape recorder will be of no use in your divorce, and may cause you even greater grief than your ex did.)

A Lifesaving Wiretap in Action

In Arizona, Ira Evans was on trial for shooting up a houseful of women and children. His first trial ended in a mistrial—the star witness was to testify, but at dawn that morning one of Ira's pals fire-bombed her house. Somehow, she and her children escaped. She then went into a witness protection program.

Still in jail, with his trial beginning again and unable to get to the witness, Ira decided to kill the prosecutor. (Hint: this is seldom a truly good idea.) The cops were tipped off by the girlfriend of one of Ira's accomplices, and an emergency wiretap began. (These are cases in which the phone company and police scramble to get the equipment up and working, while the legal team has forty-eight hours to get the

court order.) Technical problems often ensue between the phone company and the police, but luckily, within two hours of the "go" decision, the wiretap was up. I say "luckily" because the very first call intercepted was a "Class I" call.

Police divide their wiretapped calls into types. Class 1 is a call directly relevant to the crime under investigation. Class 2 is a new crime, which generally means going back to court for an amended wiretap order. Class 3 would be useless junk such as a hang-up call.

Even with automated modern equipment, these judgement calls can be onerous. Is the call incoming, outbound, or three-wayed? Who are all the parties? Just staying on top of the action can burn out a wiretap listener (known as a "monitor") in a matter of minutes. Profanity, broken police pencils, and frenzied calls for a backup "relief monitor" are customary signs of a really "active" wiretap.

Ira's case was a particular monster because he was calling collect from his jail, then three-waying through an accomplice's phone that was equipped with call-waiting. Nevertheless, his very first recorded call had him plotting with an accomplice to kill his prosecutor. However, Ira Evans's right to a fair trial still had to be protected.

Therefore the team built a "Chinese wall" to keep the wiretap information from tainting Ira's trial for assault. Though the prosecutor knew nothing about results from the wiretap, he suddenly found himself with police protection. Police were able to video Ira's hit men as they entered the county building to search out the prosecutor's office.

A week's worth of Ira's wiretapping revealed not just the murder plot, but a perjury scheme for a new alibi, and (rather unexpectedly) a massive, multi-player, financial fraud under way.

Wiretaps do have a certain humor to them. Drug dealers trying for creative codes can find themselves later explaining to a jury why they wanted to buy "half a shirt" or "three tires." One genius was so frustrated at his supplier's denseness about "opera" and "symphony" that he finally yelled at him, "Man, I want some cocaine!"

Ira Evans' murder trial hit a particular high point when one of his tapes was played to the fourteen members of the jury. Over the prison phone, he'd been coaching his alibi witness to commit perjury, so he had to explain the general setup inside a courtroom. "Well, there's the judge, then there's me and my lawyer, and there's the prosecutor, and then they bring in about a hundred m***f***g fools and they pick some." The jury found him guilty.

Hands-on with the Hardware

Whether they're analog or digital, modern wiretaps are designed to do specific things. They keep track of call detail data, including the numbers called and the length of calls. They log every "call event," even if only a hang-up. They create a record every time the monitor is listening or recording—and they make it impossible to listen without recording. Police wiretapping equipment is designed to prevent mistakes or illegal use. Monitors are required by law to minimize interception of innocent conversations, so it's critical to document times when no one is listening.

Some manufacturers record the audio as digital .wav files, using encryption algorithms to ensure the integrity of each stored call. To gather evidence to support a wiretap, police may employ other related gizmos. A court-ordered "pen register" or "dialed number recorder" (DNR) can keep track of numbers dialed from the subject's phone, though it cannot overhear the conversations themselves. A "trap and trace" device can collect the numbers of the phones calling in.

These devices give police information about calling patterns, not the call content, but patterns of phone behavior are useful anyway. A software package long favored by police for these logging and analysis functions is "PenLink" (www.penlink.com). In the hardware arena, JSI Telecom (www.jsitelecom.com) supplies DNRs, intercept devices, and various arcane accessories with names like "multi-line dial-up slave system" and "digital trunk interface." JSI's VoiceBox III™ is a rather sophisticated multimedia system that allows discovery copies to be delivered to the legal defense on fresh-burned CDs. Many officers favor Marantz tape recorders for analog recording. Recall Technologies in Palm Bay, Florida got a plum contract to supply DNRs to the DEA for the Colombian government. Its product supports up to six DNRs on a single personal computer, and they offer interception support as well (www.usdoj.gov/dea/acquisitions/acquisitions.htm).

Another source of surveillance equipment is Jarvis International Intelligence, Inc. (www.jarvisinternational.com/teleint.htm). This company runs an outfit called "The Academy" that trains law enforcement on such vital matters as "pair identification" (it's a serious blunder to tap the wrong phone line) and "listening post operations." Operations are truly critical, for if it's not done right, all the evidence gets suppressed and all that effort and expense goes down the drain.

The Paradox of Loss

by Jasmina Tesanovic

When her city was bombed in 1999, feminist and peace activist Jasmina Tesanovic sent email from Belgrade to her friends. Her war diary spread rapidly across the Net, and her book has since been published in eleven languages. It's also a film.

Modern precision bombing concentrates on destroying the technical infrastructure: phones, power plants, police stations. You may well call technology a "bitch goddess," but how would you feel if she was taken away from you? In this essay written especially for Whole Earth, *Jasmina describes normal life under those circumstances.*

My relative Rada came to Belgrade from the mountains of Montenegro, to look after my father, a widower. Before that time, Rada cared for her sheep, children, and grandchildren—a huge, healthy, emotional, and intelligent woman who loves nature, and, as she puts it, all other living creatures.

Then she entered my father's apartment, a technological pyramid built by an engineer hypochondriac for an asthmatic, disabled doctor (his wife, my mother) who hated people and germs. Rada suffered a severe identity crisis. Windows didn't open, air came through special filters. No sunlight, but an artificial system of buttons that shed light by schedule.

Nature was banned in the name of survival. Rada settled down with the TV and, after a few days of watching it intensively, she started crying. I asked her, Do you want to go back home? No, no, she answered firmly, I dream of sheep every night and I sleep well. It's that news that makes me cry. I never knew there was so much evil going on in the world.

Rada's paradoxical loss is an example of a Serbian proverb: If you have nothing, you'll have nothing to lose. Much like that CNN postmodern view, that makes us screen heroes or primitive aborigines, who live or suffer like movie stars, but only for one day. The problem with these new wars and new losses (when they are not on-screen) is that they are not at all exciting. They are rather boring and very alienating: you find you have no true enemy, no real causes, not even a definite loss, except for your own life... an unimportant detail in the global game of survival.

I remember a refugee camp in Macedonia, in the middle of the bombings of Yugoslavia and the huge Kosovo refugee crisis: one million living under one roof called the sky....After surviving the state terror in Serbia, the ethnic cleansing and shelling, an uncertain trip to nowhere among armies that wanted them dead, or out, and armies protecting them.... After the survivors took their first deep breaths and found they had some food, drink, and medicine—their real problem was how to spend the day: nowhere to go, nothing to do.

I visited a refugee camp of war victims fresh from Bosnia, people deeply traumatized by torture, the loss of homes and loved ones, in a well-kept camp near Budapest, in 1995. I was interviewing a rape victim among tears and hysterical laughter, when all of a sudden, composing herself, she asked me: Now wouldn't you like a tin of really good Italian sardines? I'm sure you haven't had them for some time. And a true Italian coffee?

I was really happy to taste those goods. When I offered her money, she said, Keep it for yourself, cash means nothing to me here, we have it all for free and we have nowhere to go. I will also give you some shoes for your daughter....She was delighted to help me with sardines and shoes, since she knew very well that we in Serbia were living on the black market of humanitarian aid....Her own loss was complete.

During the NATO bombings, after the customary alarms, we gathered and watched the sky instead of our TVs. During daylight, however, out of our wits with boredom, everybody in Belgrade was painting the walls, the façades, rebuilding the flats, furniture....A worker came to help me adapt my flat for bombing conditions. That is: move the furniture out of the way, so you won't trip over it when the lights are blown out. Place all the beds in one room, so the family can share the fear and, perhaps, the eventual death. Take care of heavy objects that might fall and crush you during a detonation.

This guy asked me shyly for a glass of water. I gave it to him and he said, Thank you thank you so much, please can I have another one. Sure, I said...and he asked for another, and another...until I realized that he came from the part of Belgrade that had been without water for days.

So I said, Well, take a shower please; I will give you some bottles to carry. But he said, No, I bring home the money, my wife brings the water, while the children find the bread. But if I drink enough, I will be OK for a day or two.

This shows that workers are the first to firmly respond to the needs of a new economic and social organization. My own family life was not so well organized, since we are some kind of late-hippie clan with spoiled, loud, Serbian children who grew up in cozy isolation. Personally, what cracked my nervous system was the fact that nobody wanted to accept the change in the rules. The new rules of life during wartime were simple enough. Buy candles during daylight, before you need them. Cruise for cigarettes, bread, bottled water before dark, before you get hungry, thirsty, and crave a smoke. But nobody unplugged our fridge, computers, and TV before the power surges of the detonations. Nobody wanted to hunt in the dark for our missing household articles.

I was cruising the Net with my laptop and batteries, writing my war diary, to be sent off into the world on a regular basis...assuming, that is, that the electricity or phone lines would work. Light came and went randomly from one neighborhood to another; the same for phone service. While writing my diary and emailing it, I could generally use the same electricity to fry up some meatballs—lunch for my spoiled, uncomprehending family. Power often came in spasms of five minutes or less, not enough time to finish either text or meatballs. A friend's flat might well have electricity, but there was no petrol, no bus, no way to get there on foot before their five magic minutes of light had run out.

Chasing electricity posed another

problem. Light was given to Belgrade's priority centers, which were also the so-called "legitimate military targets." I never knew before how many police or army points existed in my city. The army was camping all around us, in schools, in hospitals, in the parks....The whole of Belgrade was a legitimate military target.

Soon the city reorganized into very small blocks. I realized that, between two alarms, I never had time to leave my flat and reach my parents. They were old, and helpless without their maid, who was living with her own family, completely traumatized, at the outskirts of Belgrade, bombed on a regular basis. Therefore, I traded parents with a friend of mine who had her own parents in my neighborhood. I brought them water and bread, corn flakes and candles, or meatballs. She did the same for my parents.

Babies and old people were behaving better: They loved the collective lives, intimacy with strangers, and playing with shortages. You can give a baby boiled grain in water and say, This is an Arab specialty, couscous. Teenagers and working people, by contrast, were really pissed off. Every corner of the narrow curvy streets of Belgrade had household chairs on the pavement where young guys were drinking beer or smoking joints. After a few days of general military paranoia from the draft, the drafted soldiers were openly joining the teenagers....I was afraid of those wild groupings at first, afraid for my teenaged daughter, it was anarchy in the streets.... A friend of mine said: I am afraid of crossing parks: what if I see my husband on a bench kissing some girl?

My daughter admitted afterwards that, every day, she and her best friend would find some bus with petrol, then ride the whole route, looking for destroyed buildings and gawking for dead bodies....It broke their tedium.

The alarm routine was our firmest timetable, and in wartime it is very important to have one. NATO was really precise in targeting. They did it twice a day for months at exactly the same time. Whenever the planes didn't fly and the alarms failed us, we really got nervous. We couldn't switch to the usual candles, taste the food we hunted for that day, exchange our war gossip...move around the basements with heads down as if it were raining, scuttle through our restricted blocks....We sat up till dawn waiting for an alarm, hoping to get it over with. Some people took sleeping pills at the first alarm, hoping to wake at the all-clear. We even lost our fear of the detonations; we opened our windows to save the glass.

My father had been preparing himself for this catastrophe all his life. This was his instinct as an engineer and World War II survivor. He had supplies of all sorts of tinned food and tools. Unfortunately, he couldn't prepare himself for his loss of a male traditional role. With my mother sick, he had to cook and wash all the dishes. He did this under her severe control. As the state TV building exploded in flames, littering their street with corpses, my mother screamed at him because he'd dropped a pan.

Like everyone else, we watched CNN in order to see what was happening to us. The NATO briefing was a high point of our day. We generally had electricity at that time, because the family flat was quite close to the military secret police. When my husband failed one day to come home for the NATO briefing, I worried...and I was right, for he'd spent his time with an opposition journalist who was assassinated a few minutes after they parted. Naturally, we saw that on TV, too.

Like old-fashioned patriarchal families, in wartime we had new rules of reticence and silence. Even my daughter, the youngest of us, never said she was afraid. She merely said that the planes were too low, that she had to close her windows. I knew she was afraid of the noise, but couldn't tell her that, any more than I could tell her that I was afraid of exploding shards of glass. I managed to get invisible tape to brace her windows, for she found the colored tape embarrassing. After all, she was a teenager; a war always takes place in specific worlds.

I remember that I scorned my poet friend when, years ago, he told me that he could only read properly in his own room, in his own chair. At that time I read in buses, on beaches, holding a book in my lap under the table during boring conversations. Reading was impossible in wars and camps. Every sound was like a spoken word, bearing more truth than the words in books, which seemed like gross lies....Writing was easier and everybody did that, besides renovating the flats, houses....You can also raise flowers and plants in wartime: from marijuana to salads. When torrential rains frustrated the NATO pilots, from the cracks of the walls from explosions, huge edible mushrooms sprang....what a joy for all of us.

You do not watch football matches or sports....We sat on the terrace and watched the cockroach fights. The bugs came out of nowhere in huge numbers, with strange patterns of cockroach behavior, actually approaching people, as if begging for something....We couldn't frighten them. Nobody dared step on a cockroach, not even the most daring children. They became our entertainment, like some night club on a different planet; we took part in their way of life.

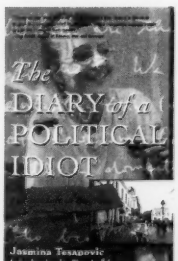
Wars are an anticonsumer's adventure. Like those hippie castaways who spend months on treasure islands, low on clothes, food or water, hunting for love and nature....Yet death becomes more natural than it ever is during peace. As time goes by, the more I become aware of the horror, the trauma that we all went through, almost without real argument.

Every night I carried my handy refugee kit to the shelters. Contents: first aid, passports, some jewels, a phone book, a notebook, a pencil, a bottle opener as my self-defense weapon, and plenty of pills for eternal or temporary sleep. That kit is still ready in my closet. I can leave my country, in war or peace, in five minutes flat, and that feels good.

This article in *Whole Earth* may not be entirely useful for future catastrophes, but then, that's the way. The advice we got from email friends in besieged Sarajevo didn't apply to our daily situation in Belgrade. The Sarajevans had a list of how to cope with elementary needs. In Belgrade we had it all and yet nothing, especially no future. Every war has a different code as an artistic creation; every war has its own language.

If wartime happens to you some day, it will be different from this. You yourself will be a different person from what you are today, without your paradoxical aura of things and needs, your alienating civilization of postmodern capitalism....It happened to my relative Rada the other way round, but it was still traumatic: to suddenly have a TV, instead of always living without one. They may tell you certain things that sound useful: such as to fill the bathtub with water, so as to have some handy when the taps stop running. Try that in real life, though, and you'll flood your neighbor downstairs.

If all the medicine is gone, just don't get sick. Crazy as it sounds, that sure works best.



The Diary of a Political Idiot
Normal Life in Belgrade
Jasmina Tesanovic
2000; 136 pp.
$14.95
Midnight Editions

The Vividian View of Design

Viridian Principles 2.0

No design movement can feel quite complete without a manifesto publicly declaring its principles. These are the glorious principles of the Viridian Movement. This cheery blast of sloganeering shows why our unique approach to design, tools, ideas, and practices is a radical improvement on the classical beliefs of a whole bunch of dead people.

FUTURIST PRINCIPLES

Embrace Decay

For bipedal mammals in a biosphere, eternity is very unhealthy. Nothing physical is eternal. In particular, mechanical devices quickly cease to function, while their useless components persist around us, ugly and dangerous. Entropy deserves our respect and attention. Entropic processes such as corrosion, rot, rust, degradation, delamination, and disintegration should be closely studied, harnessed for industrial use, and even aestheticized.

Planned Evanescence

"Planned Obsolescence" means that a product will be driven off the market, within a known time frame, by some purported improvement. The Viridian principle of "Planned Evanescence" extends this practice by demanding that the product and all its physical traces should gracefully disintegrate and vanish entirely.

Eat What You Kill

It's perfectly acceptable to supersede some time-honored tool or practice. However, you should take pains to fully comprehend the thing you have rendered obsolescent. You are removing some part, however modest, of the infrastructure of civilization. You are destroying the work of previous designers; you should offer them the respect you yourself would hope for, under similar circumstances. This is for your own good. You can't comprehend your own accomplishment until you have fully internalized and understood the accomplishment that you are undoing.

The Future Is History - Be When You Are

The future is not a stage set. The past is not a sacred myth. The future is already here, it's just not well distributed yet. The past and the future are this place at a different time. The future is advancing upon you, and the past retreating, at a remorseless rate of one second per second, one year per year.

You can seek understanding anywhere, but you can only act in the moment. Your own epoch is your own problem. If you call yourself "post," "neo," or "retro," you are begging for someone else's troubles.

History Accumulates

The arrow of time moves only in one direction. As long as civilization persists and our records multiply, we have more and more history. The compost of history is thicker for us than it was for our predecessors—and thinner than it will be for our descendants. We must invent better ways to manage our increasing wealth of history.

MORAL PRINCIPLES

Look at the Underside First

Legions of people are paid large sums to promote the positive aspects of commercially available products. Very few people earn their daily bread by pointing out malfunctions, bugs, screw-ups, design failures, side effects, and the whole sad galaxy of tradeoffs and failings that are inherent in any technological artifact. To counteract this gross social imbalance, a wise designer and a wise critic will make it a matter of principle to look at the underside first.

Design for Evil

Any innocent product that becomes suddenly genocidal in the hands of a tyrant has been designed by a dangerous naif. Every design process is incomplete unless it takes into careful consideration what could be done with the product by a dictatorial megalomaniac in command of a national economy, a secret police, and a large army.

Design for the Old

The median age is advancing steadily around the world. The twenty-first century will have a historically unprecedented demographic structure. Short of catastrophe and mass slaughter, we will never see the twentieth century's youthful demographics again. The senior members of society have their own ergonomics and anthropometrics. If you don't design for them, you're designing for an ever-shrinking fraction of the world.

Superstition Isn't Inspiration

There's no effective substitute for experimental verification and reproducible results. Don't mistake mystic wish fulfillment and the promptings of your unconscious for objective evidence. It's a breach of taste to imagine that the vagaries of your own imagination are more interesting than the world.

POLITICAL PRINCIPLES

Viridian Inactivism

Activism is an attention hog, and very time-and energy-intensive. A better approach is to find the things you are doing that intensify the problem, and just cease doing them. Put in less overtime. Sleep late.

Have a nap after lunch. Burn less midnight oil. Park your car, turn off all the lights in your apartment, and go outside in the sunshine and read a book. Spend an hour on your mascara if you feel like it. Don't allow yourself to be spooked into Stakhanovite overdrive; seek command of your own life.

Do Less with Less

We're altering the climate by burning too much fossil fuel. We should struggle valiantly to find alternative sources of energy, but it's just as gratifying to simply become less frenetic. What exactly are we doing at the moment that is worth ruining the climate for? Relax.

There's No One So Green As the Dead

Dead people are the ultimate Greens (trumped only by people who never existed in the first place). If you feel helpless with guilt because of your bad environmental habits, pause and think of the very brief time in which you employ the Earth's resources, and the long, long eons in which you'll be just raw material again.

The Viridian Grandfather Principle

When a particular course of green action is suggested, ask yourself if it might not be done better by someone who is dead. For instance, conserving water. Is your deceased grandfather better at conserving water than you are? He is, isn't he? He's even better at boycotting ExxonMobil. These may be worthy efforts, but they are not Viridian. Viridians prefer to carry out green activities that living people can do well.

PRINCIPLES OF THE AVANT-TECHNOGARDE

The Biological isn't Logical

Design tends to follow the leading technical products of its period; in an age of aviation, even pencil sharpeners are streamlined. Given this longstanding trend, the coming biogenetic technical revolution should produce a biomorphic epoch in twenty-first-century design. But the living world was not designed by a teleological, rationalist, reductionist process. The living world grew irrationally through nonsystematic, genetic exploration of niche possibilities, pruned back by natural selection and occasional massive disasters. So if you're building distributed networks, learn from crabgrass.

Augment Reality: Aestheticize All Sensors

Sensors, instrumentation, and mediated monitoring systems of all kinds are the next aesthetic frontier. Computation/communication will progress toward omnipresent, on-chip sensors, "ubiquitous computation," or "augmented reality." Sensors must interact with the human sensorium, and are properly seen as an area that is not primarily technical, but aesthetic.

Make the Invisible Visible

We can manipulate, store, create, and analyze graphic imagery with historically unprecedented ease and power. This trend should be recognized, advanced, and artistically exploited. Advances in instrumentation can be used to change the zeitgeist. If carbon dioxide were blood red, our skies would look ominous indeed.

Less Mass, More Data

If you always know where something is, you don't have to chain it up. If it can see stress coming and duck, it doesn't need to be sturdy. If it pops up and vanishes repeatedly on signal, it doesn't have to take abuse. Physical resources should be replaced with information when possible.

Tangible Cyberspace

"Tangible Cyberspace" introduces computer-generated artifacts and processes into the deepest and most intimate textures of the physical world. Viridians seek a profound new interrelationship of the computational and the environmental. We seek to make the screen permeable, and to turn "computers" into worldly, sensual entities.

Seek the Biomorphic and the Transorganic

"Nature" is over. There's not a liter of seawater anywhere without its share of PCB and DDT, and an altered climate will reshuffle the ecological deck for every creature that breathes. A twenty-first-century avant-garde must deal with those consequences and thrive in that world. We have already painted flowers. We want to know what a flower means when a flower has onboard processing, amped-up genetics, and its own agenda. Thus a central Viridian aesthetic dictum: "A Rose Is No Longer a Rose." "What does it mean when you look into the garden and the garden looks back?"

Datamine Nature

"Seeking Truth from Nature" was a rhetorical and ideological support of the Pre-Raphaelites and Art Nouveau. It worked well twice and can work again. There is a wealth of aesthetic novelty to be found in previously invisible aspects of nature, such as cellular metabolism, noninvasive medical imaging, hybridomas and chimeras, artificial life entities, and chemosynthetic life forms.

Grow Complexity

A Viridian aesthetic looks for patterns that are both tasteful and previously impossible. With computers, it is absurdly simple to create graphic patterns of any level of busyness and complexity. Without human aesthetic intervention, this art is puerile and ugly.

RESEARCH PRINCIPLES

Walk Through the Walls of Knowledge Guilds

The boundaries that separate art, science, medicine, literature, computation, engineering, and design and craft generally are not divine. These boundaries are socially generated entities meant to protect the power-interests of knowledge guilds. Research techniques are not identical, nor are results all equally valid under all circumstances. But there exists a sensibility that can transcend intellectual turf war with no loss of rigor. If you choose to do it, you can step outside the boundaries history makes for you. You can walk through walls.

Viridian

Viridian Aphorisms

Progress is
the mother of problems.
Gilbert Keith Chesterton

It takes time to ruin a world,
but time is all it takes.
Bernard De Fontenelle

The obscurest epoch is today.
Robert Louis Stevenson

Our ignorance of history
makes us vilify our own age.
Gustave Flaubert

From such crooked wood as that
which man is made of,
nothing straight can be fashioned.
Immanuel Kant

A lot of people think art's weird and stupid. I want to get to those people get them to come in and go "Arrrgh!"
Damien Hirst

What is exhilarating in bad taste is the aristocratic pleasure of giving offense.
Charles Baudelaire

How many of our daydreams
would darken into nightmares, were
there any danger of their coming true.
Logan Pearsall Smith

Among all human constructions the
only ones that avoid the dissolving
hands of time are castles in the air.
Frederico De Roberto

Long years must pass before the
truths we have made for ourselves
become our very flesh.
Paul Valery

All our final resolutions are made in a state of mind which is not going to last.
Marcel Proust

Even the voice of conscience
undergoes mutation.
Stanislaus Lec

His passions make man live,
his wisdom merely makes him last.
Alain Chamfort

The ardor chills us
which we do not share.
Coventry Patmore

In individuals, insanity is rare;
but in groups, parties, nations,
and epochs it is the rule.
Friedrich Nietzsche

Nothing has an uglier look to us than reason, when it is not of our side.
Edward Fredrick Halifax

What is wanted is not the will to believe, but the will to find out, which is the exact opposite.
Bertrand Russell

Those who will not labor
mightily on their own behalf
shall be given other masters.
Xenophon

Most of the evils of life arise
from man's being unable to sit
still in a room.
Blaise Pascal

If we were not all so excessively interested in ourselves, life would be so uninteresting that none of us would be able to endure it.
Arthur Schopenhauer

If you can talk brilliantly enough about a problem, it can create the consoling illusion that it has been mastered.
Stanley Kubrick

Man does not live long enough
to profit from his faults.
Jean De La Bruyere

People like to say: "Revolution is beautiful, it is only the terror arising from it which is evil." But this is not true. The evil is already present in the beautiful; hell is already contained in the dream of paradise.
Milan Kundera

You will not become a saint
through other people's sins.
Anton Chekhov

Charlatans are generally sublime.
V.V. Rozinov

How these authors magnify their office! One dishonest plumber does more harm than a hundred poetasters.
Augustine Birrell

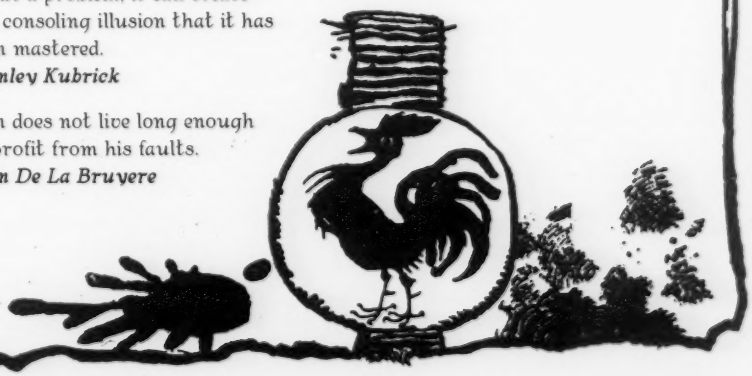
To make astute people believe
one is what one is not is, in most
cases, harder than actually to
become what one wishes to appear.
Georg Christoph Lichtenberg

It is a luxury to be understood.
Ralph Waldo Emerson

Every luxury must be paid for,
and everything is a luxury,
starting with being in the world.
Cesar Pavese

"Forgive us our virtues."
That is what we should ask
of our neighbors.
Friedrich Nietzsche

Every hero becomes a bore at last.
Ralph Waldo Emerson



The Hip-Hop Generation Is Now

Carol Cooper

This is not Carol Cooper

The self-styled "hip-hop generation" has often been pilloried for its crass consumerism, but Madison Avenue really appreciates it. If they want to know what white America will consume tomorrow, they take a good long look at what black hipsters are consuming today.

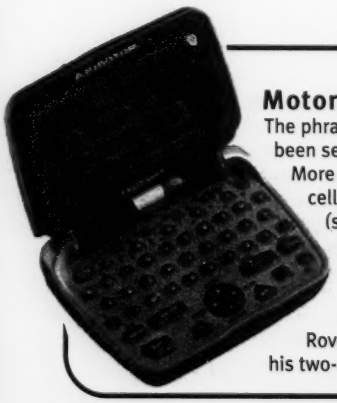
In three critical categories—transportation, communication, and personal ornamentation—black Americans are notorious early adopters, signaling the high style or high serviceability of a new brand by rapid assimilation, followed by often radical customization. And best of all for product manufacturers, these consumers even provide free advertising by listing their favorite new toys on the hit singles from gold- and platinum-selling albums.

And they don't just ring with tacky preprogrammed tunes. Top black producers have created pager versions of major hits like "Big Pimpin'" that can be beamed across space and time to fellow pager-holders who request them.

Madison Avenue is hip to the trick by now. While black-owned name brands like FUBU, Karl Kani, Baby Phat, and Sean Jean are now replacing many favorites from the last century such as Gucci and Tommy Hilfiger, black America is still quite eclectic about what products it chooses to support.

One major marketing challenge: how to sell green cars to the status- and style-conscious hip-hop generation. Children and grandchildren are important considerations for black Americans—most of today's chart toppers already have kids. So you'd think that as procreative trend setters, we'd want to preserve some breathable air for our heirs, to go along with that safe-deposit box full of diamond and platinum jewelry. Unfortunately, dinky, sluggish items like the Honda Insight (or even the more promising Toyota Prius)—although perfect for a single urban female exec of the rock-climbing/tree-hugging persuasion—just make the wrong statement for power players like DMX or Puffy Combs, who need speedy, roomy, downright imposing luxury vehicles to contain friends, family, and their larger-than-life economic and cultural potency.

"Big Pimpin'"
from Vol. 3,
The Life and Times of S. Carter (CD)
Jay-Z
1999
$14.99
Def Jam
One of the anthems of the summer of 2000 (explicit lyrics). –CC



Motorola 2way Pager
The phrase "hit me on the two-way" on rap and r&b records has been selling Motorola 2way pagers now for over two years. More popular and considered far hipper than last century's cellphone, these silver and black messaging palmtops (silver being the preferred model) now provide a 24/7 communication link between most of the power elite in the world of black entertainment. The last time Rush Communications C.E.O. Russell Simmons went out of the country for a weekend, 2ways rang in Range Rovers and executive suites from coast to coast announcing his two-day communications blackout.

While many well-heeled twenty-first-century African Americans are quite bullish on Pur water filters, organic foods, cutting-edge herbal supplements, yoga, gravity boots, and the latest in audio/visual and home gym equipment (usually customized), they still fall hard for the diesel-guzzling, road-hogging, tire busting, upholstered tanks called "sports utility vehicles." Riding high above ordinary traffic, surrounded by nearly 5,000 lbs. of steel, conveys a very comforting sense of invulnerability to the typically embattled black consumer. The most savvy of these young entrepreneurs lease their vehicles rather than buy, so they can trade up every year and deduct the cost as a business expense.

Music- and movie-industry people use SUVs as mobile offices, equipped as they are with flip-down dvd screens, six-CD changers, a voice-activated cellphone, and a huge touch-screen navigation system that recites block-by-block directions in a dulcet female voice. An additional psychological factor in the SUV's favor is that a fully loaded Lincoln Navigator can comfortably seat a crew of six to eight medium-sized adults. And while it has the sleek good looks of a

getaway car from a Bond film, it easily doubles as a family car for schlepping the kids.

Wives of the black and well-off are often gifted with a Lexus or Jaguar sedan which combines a similar automated navigation system, deluxe audio system, and handless cellphone with an onboard road-emergency messaging service. Good for marital relations, and a good "loaner" for those occasions when the man of the house wants to look *pretty* as well as successful. If any major manufacturer could squeeze similar features into a green machine that isn't as big and slow and ugly as a tractor, they'd have a clear shot at America's most dynamic consumer base.

HAIR R US

Carol Cooper

Even the most cursory glance at MTV these days reveals a curious phenomenon: black hair ain't what it used to be. From the long black braids sported by TV icon Brandy to the Tressy-length blond mane worn by Beyoncé Knowles of Destiny's Child, hair extensions both organic and acrylic have become the number-one beauty accessory of today's black woman.

And not just black women. Disney-pop vixen Christina Aguilera recently got blond, braided extensions for a video shoot.

While expensive human hair is still preferred by those who can afford it, cheaper, more versatile Japanese acrylic fibers (with names like Kanekalon and Toyokalon) are selling by the truckload from Harlem to Dakar.

When done by a professional, the average hair weave, whether glued, heat-bonded, or crocheted into natural hair, lasts about two months. With up to a pound of hair required for many of those popular MTV looks, it's easy to see that another million-dollar industry has been born.

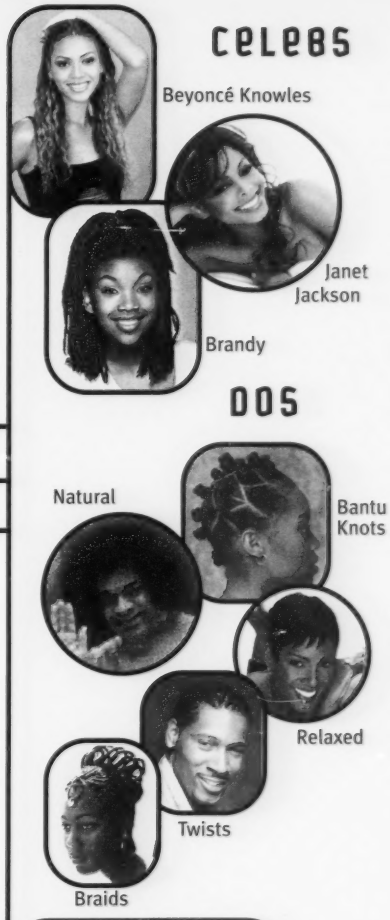
In the early 1900s America's first self-made black female millionaire was Madame C.J. Walker, who created jobs for black women across the country by inventing, manufacturing, and selling hair-care products aimed at her peers. Between Madame Walker's training blue-collar women how to pamper and grow their hair, and expatriate entertainer Josephine Baker's popularizing a black version of the French "Marcel Wave," there is ample twentieth-century precedent for the hair weave explosion of 2001.

Thirty years ago the only way Janet Jackson could approximate the hairdo on her current album cover was by dosing herself with a lye-based chemical relaxer, or greasing up her kinky locks with Afro-Sheen, then slowly combing small sections limp and lank with a metal comb heated over a stove's open flame. Today all it takes is a nice tight weave, a brush, and a daily dab of Luster's Pink Oil Moisturizer. For all its time-consuming expense, the hair weave—as pioneered by black hairdressers (and ambitious Japanese chemists) actually protects natural hair from these totalitarian tortures of the last century, while offering an unprecedented technical range of colors, textures, and styling options.

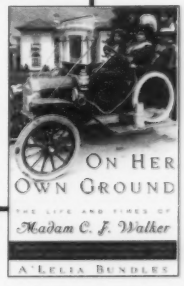
Nowadays salons can purchase weaving kits and hanks of real or acrylic hair in any color or texture through the Internet (www.lusterproducts.com/pink.html). Novices can learn from mail-order videos how to use Kanekalon to construct hefty Bantu knots or gravity-defying goddess braids. Nationally advertised salon workshops routinely tour black urban areas to demonstrate everything from how to start dreadlocks to how to weave or coil natural hair.

While human hair—in wig or weave form—is perhaps the ultimate green recyclable, it burns more easily, is harder to attach, and loses a curl more quickly than the Japanese acrylics. Further, a human hair weave can cost more than twice what an acrylic weave costs. Hence, Kanekalon and Toyokalon still rule in Harlem's storefront Senegalese braiding parlors that offer working-class women Hollywood beauty at ghetto prices.

Carol Cooper is a New York-based freelance writer and pop-culture critic. Her work has appeared in a variety of publications, including New York Newsday, Elle, The New York Times, Essence, Wired, *and* The Village Voice.



On Her Own Ground
The Life and Times of Madam C. J. Walker
A'Lelia Bundles
2001; 400 pp.
$30
Scribner

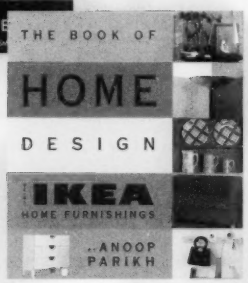


Chronicles of a DEATH Foretold

by Dave Prager

Dave Prager recently graduated from Syracuse University and lives in New York City.

Last March, fifty tons of metal screamed across the sky from 137 miles above the Earth. When it was launched in 1986, the Mir space station had an anticipated useful life span of three to five years. Fifteen years, 104 cosmonauts and 2.2 billion orbital miles later, Mir—leaking, dented, rattling, and thoroughly infested with fungus—was finally pronounced beyond repair.



Off the Planet

Surviving Five Perilous Months Aboard the Space Station Mir
Dr. Jerry Linenger
2001; 256 pp.
$14.95
McGraw-Hill
One hundred thirty-two days inside a decaying, unstable space station, reeking of mold. —BS

The Book of Home Design Using Ikea Home Furnishings

Anoop Parikh
1995
$27.50; 208 pp.
Harperperennial Library
Famed for those clean lines and moderate prices. —BS

> One hundred and fifty tons of cosmic trash, returning like Icarus to the ecosystem.

The space habitat was heaved from orbit by a Progress cargo vehicle, aimed at a reentry point northeast of Australia. Eighty tons of the station burned up in reentry; momentum carried the remaining fifty tons thousands of miles southeast, where it fell steaming into a stretch of the Pacific between New Zealand and Chile.

The millennium opens with the Soviet space dream disposed of as planned—with the exception of one piece of red-hot scrap that reportedly scared some sheep in Dagestan. One hundred and fifty tons of cosmic trash, returning like Icarus to the ecosystem.

My roommate is not a cosmonaut, but she owns one of those fashionable-yet-functional shelving units from Ikea. Cut-rate wood shelves, metal hooks, metal rungs. It hangs together wonderfully—gravity being free and reliable in our neighborhood.

But in a few years, a rotating cast of books will take their toll on that Ikea. A few broken hooks or bent rods, and it's dead as Mir. Decay happens. Entropy consumes even the most resilient examples of human ingenuity—in, on, or off the Earth.

Unfortunately, a trip to the dump does not cause Ikea shelving to cease to exist. It's still there, just as Mir is still there on the ocean floor. We've just stopped admiring it, that's all.

That's the true commonality between blundering Soviet metaphysics and sleek Euro minimalism. Truly sophisticated design wouldn't blast us out of the natural realm with raw power. It wouldn't even use less to do more. Instead, it would use its power and ingenuity to vanish entirely on command. Planned evanescence. Evanescence is the only true completion to the life cycle of any product. Technology: evaporating.

AMERICAN SCIENCE & SURPLUS

3605 Howard Street, Skokie, IL 60076
847/982-0870, www.sciplus.com

American Science & Surplus doesn't offer Viridian products...but you might be able to build some cybergreen gear with the tools, parts, and materials it sells.

In addition to laboratory glassware, electronics parts, tools, science toys, and gimmicky consumer items, AS & S's densely packed, cheekily written catalog offers things like Russian microscopes, Cold War-surplus Geiger counters, and accordion halves. Imagine Edmund Scientific merged with Archie McPhee.

The website is serviceable, but get your hands on the free print catalog.

I'm fond of AS & S, if only because it's the only place I know that sells 1/4" masking tape.

—Stefan Jones

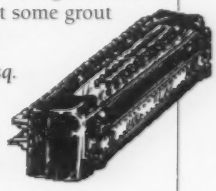
Tummy, Tickers, and Bending Bones

Accurate, well-detailed models of all those body parts that wear out about the time your Social Security kicks in. The two-piece heart is molded ceramic, 4-1/2"x 4" x 2-1/2", painted in shades of red; it's not hinged, but opens to reveal ventricles and such. The 6" articulated model of the human knee is very well constructed, and bends enough to show how the ligaments, tendons, and cartilage work. The red rubber muscles on the model hip demonstrate the interaction between muscle and bones. While both of the joints are resin and rubber and do move, they are not intended to be fully articulated. Treat them as though they were your own, after a long day of cross-country skiing. All are anatomically correct, educational, and way cool. —*SJ*

27617 Heart, Two-Piece $12.50
28863 Knee $15
28864 Hip with Muscle $19.50

Matrix Tile

White ceramic tiles, 13 mm thick. They are 2" x 2" with dense patterns of tiny square holes. We're told they're made to float in pools of molten metal, collecting impurities. Neat! So we expect they're pretty heat-resistant and good for the BBQ pit or lining the kiln. If you're less daring, get some grout and retile the tub. —*SJ*



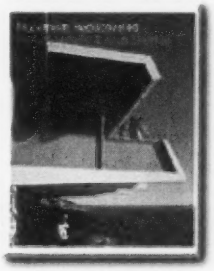
29194 Matrix Tile, 2" sq. $3/pkg (2)

19516 DIY Accordion Half $39.50

89971 Stereo Microscope $595

MODERNISM REDISCOVERED

Pierluigi Serraino & Julius Shulman
2000; 576 pages
$40
Taschen

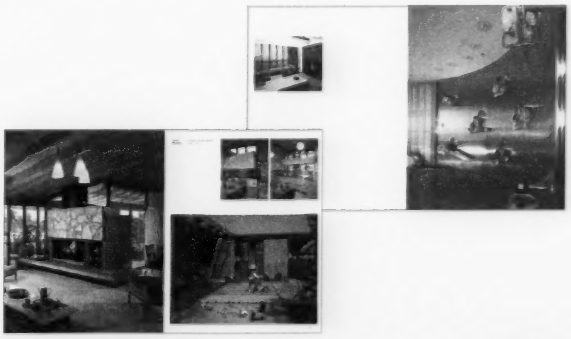


With this gorgeous retrospective of public and private buildings built between 1939 and 1980, the thoughtful publishers at Taschen ask two important questions: Why are some buildings (and their celebrated designers) still famous, while others have dropped from memory? Could it be the *photography*?

Since we Viridians want our cybergreen design philosophies to take permanent root in the public consciousness, we have to share these two concerns.

Consider Julius Shulman's color and black & white shots, originally taken for *American Modernism* magazine. Here we see the brilliant yet forgotten architect Gordon Drake constructing affordable, aesthetically optimistic housing in the wake of WW II; buildings that would fit organically and unobtrusively into their environments, whether those be mountainous, woodsy, desert, seaside, or some temperate combination thereof.

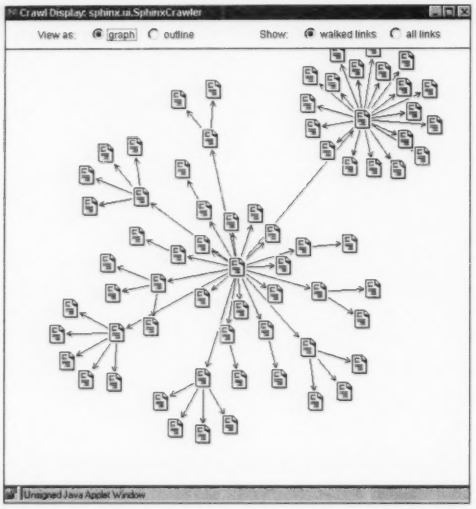
Feast your eyes on that natural stone, the local hardwoods, panoramic glass walls, interior ponds, Japanese gardens, strategic use of natural light, and a very Japanese sense of flow-through in terms of indoor/outdoor living. Yet none of the works in this book received massive publicity during its heyday. The buildings may have since decayed, yet the imagery is still here, a helpful reminder of how pervasive this proto-Viridian aesthetic once was in American architectural ideology. —*Carol Cooper*



WebSPHINX:
A Personal, Customizable Web Crawler

by Mikael Huss & Joel Westerberg

http://www.cs.cmu.edu/~rcm/websphinx/ go



There's a problem with web surfing: no sense of direction. Slow-loading webpages and crummy browsers feed your screen one page at a time. You never see an overview of the web's structure.

Explorer and Netscape, the factory-issue web browsers, are too crude for conceptual web research. But a web spider crawls the web for you, plowing through page after page, relentlessly extracting links, page titles, page sizes, and even keywords. Search engines acquire their databases this way, but they jealously guard that painstakingly indexed data.

Though the standard home PC isn't on a par with the indexing factories of major search engines, it's perfectly possible to do a limited, personal crawl of smaller portions of the web. This is where WebSphinx comes in. It's Java-based, and we may also rejoice in the fact that it's open-source. To start, select a local or global crawl, type in the URL you care to crawl from, then watch that spider make its multithreaded way through the linkspace. Each page becomes a document icon, with links as arrows connecting pages.

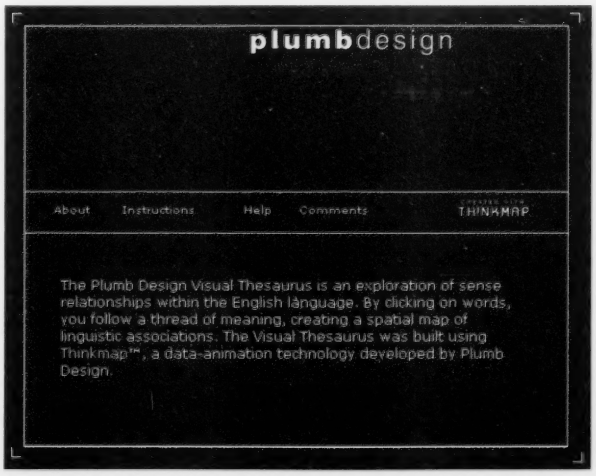
WebSphinx shines with its graphic interface: an ongoing webcrawl is like an evolving protozoan lifeform, rocking in the gentle currents of the oceanic web. The look and feel of WebSphinx resemble yesteryear's big hit from the net.art scene, Plumb Design's Visual Thesaurus.

http://www.visualthesaurus.com/ go

WebSphinx navigation is fast and intuitive. You hover the cursor above a page to see its title, then double-click to launch the page in another window. The real strength of this program is its God's eye view of the web, zeroing in on content-dense formations, deep within websites.

WebSphinx is ideal for ego-surfing; by launching it from your own home page, you can easily find your place in the web's semantic space.

Joel Westerberg is a website editor and graphic designer who is heavily into power tools, screwdrivers, and tool belts. Mikael Huss is Sweden's foremost expert on Chinese science fiction.


plumbdesign
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THINKMAP
The Plumb Design Visual Thesaurus is an exploration of sense relationships within the English language. By clicking on words, you follow a thread of meaning, creating a spatial map of linguistic associations. The Visual Thesaurus was built using Thinkmap™, a data-animation technology developed by Plumb Design.

Learning to Manage While Managing to Learn

by Garry Peterson

The Ecological Detective Confronting Models with Data
Ray Hilborn and Marc Mangel
1997; 330 pp.
$24.95
Princeton University Press

An excellent accessible introduction to ecological problem solving. —GP

"Each of the case studies we use to illustrate a particular point is a bona fide research study conducted by one of us. Even so, some readers of drafts accused us of the unpleasant and unprofessional, but too common (especially in evolutionary biology), behavior of setting up "strawpersons" just to knock them down...This charge is unfair. These apparently ridiculous models were in fact proposed and used by pretty smart people. Why? Because they had no alternative models. Our view is that the confrontation between more than one model arbitrated by the data underlies science. If there is only one model, it will be used, whether the questions concern management (as in the Serengeti example) or basic science (as in the insect oviposition example). Without multiple models, there is no alternative.

Adaptive Management of Renewable Resources
C. J. Walters
1986
Out of Print, but available from Fisheries Center at the University of British Columbia, www.fisheries.ubc.ca /Books/books.htm

This book is a classic. It focuses on the organizational, technical, and modeling aspects of adaptive management. The book's early chapters are very accessible while the later ones provide a wealth of technical detail on mathematical approaches to management under uncertainty. —GP

"When you reject the extreme stances and recognize modeling as a very human way of groping for understanding, it should be obvious who will benefit most from it: those who engage in it directly. A great deal of money has been wasted by government agencies on contracts to model builders, in the hope that grand predictive models will be produced and then used by the agency. The modelers certainly learned a lot from these efforts, and have produced many lovely (and largely ignored) reports detailing formulations, predictions, and uncertainties. A few of the models have seen some use, but mostly as interactive computer games that are not taken seriously, or as generators of thick printouts to impress audiences who will never read them.

Compass and Gyroscope Integrating Science and Politics for the Environment
K. Lee
1995 (reprint ed.); 243 pp.
$19.95
Island Press

In elegantly written introduction to adaptive management that emphasizes social learning and politics. —GP

"I have come to think of science and democracy as compass and gyroscope—navigational aids in the quest for sustainability. Science linked to human purpose is a compass: a way to gauge directions when sailing beyond the maps. Democracy, with its contentious stability, is a gyroscope: a way to maintain our bearing though turbulent seas. Compass and gyroscope do not assure safe passage through rough, uncharted waters, but the prudent voyager uses all instruments available, profiting from their individual virtues.

Conservation Ecology
www.consecol.org
Free

This is a five-year-old, peer-reviewed, Internet-based ecology journal that is the leading journal on theory and practice of adaptive management. Its editor-in-chief is C.S. Holling, one of the founders of adaptive management. —GP

Nature continually changes. Yet people and animals depend upon a reliable supply of clean air, fresh water, and fertile soil. How can we maintain the ecologies that we need and love amid continual, unpredictable change?

Ecological management offers an answer, but is difficult. Like walking in the dark, ecological management is an activity full of uncertainty. To make matters worse, the continual change of nature makes you unsure of where you stand, while nature's unpredictability means that those snuffling sounds you hear in the distance could be coming towards you.

In nature, uncertainty is inescapable. While collecting ecological data can help reduce uncertainty, it can't eliminate it all. Consider Lake Mendota, Wisconsin. Scientists have extensively studied this lake for over a hundred years. They understand a lot about the lake—the dynamics of fish, what controls aquatic weeds, and when it will turn green. However other dynamics remain uncertain. Lake Mendota is currently soaking up a fair amount of fertilizer from the farms in the lake's watershed. One of the world's top lake ecologists, Prof. Steve Carpenter, recently attempted to predict if the lake would be irreversibly changed by these inputs of nutrients. But even with excellent data and solid ecological theory, the complexity of nature prevented him from being able to predict whether changes will be irreversible.

Ecologists have nevertheless been getting better at sketching the big picture, and figuring out effective ways to cope with this uncertainty. There are a variety of ways to manage unpredictable complexity.

People can simply ignore it, and try to bull their way through. They can seek solace in simplistic explanations that claim certainty. In ecological management, this approach manifests itself as top-down, command-and-control practice.

Command-and-control management assumes that effective policies have been carefully planned to solve problems, and therefore that technocrats know best. When the policy fails, people become the scapegoats: the failure is all due to human inability or unwillingness to follow, enforce, or implement the commands.

However, as has been repeatedly demonstrated, in places ranging from Maoist China to the capitalist USA, command-and-control management typically breeds surprising ecological disasters. Natural resources collapse amidst social and economic conflict. We might put it this way: while walking in the dark, just confidently stride toward where you think you want to go. Morale is high, and once in a while this approach works well. Usually, it results in a trip to the emergency room.

Ecological policies are not "solutions" because we do not (and never will) know enough to "solve" an ecosystem. All management policies implicitly embody someone's concept of how an ecosystem works. When the inner workings of an ecosystem are frankly unknown and unknowable, then many alternate conceptions of an ecosystem are plausible. Many models are equally consistent with existing data.

Policies should properly be viewed as questions rather than answers. The most important thing is not selecting the "correct" policy and imposing it, but managing in a way that allows people to learn from managing.

This approach is called adaptive management. Adaptive management consists largely of creating effective ways to learn. Its three main tools are simulation modeling, modeling workshops, and management experiments.

Effectively applying these tools requires a mix of social and technical skills that are best carried out by teams.

Modeling

Computer models integrate existing experience and scientific information. A model creates a simplified version of the real world. This cartoon world provides a flexible and forgiving arena for experimentation. This can reveal some practical possibilities that are by no means obvious from the situation on the ground. Of course, computer models do not "solve" management problems, but they reduce uncertainty and suggest new approaches. They can illuminate the chief, credible, alternate ways of conceptualizing a problem.

Computer models are most useful when they are built with specific questions in mind. New questions then require new computer models. To encourage question asking, adaptive management focuses not just on the model itself, but on the process of model building. The creation of a new model means conceptualizing the system under study. This is a powerful way to improve management, because a new model suggests new policies.

Modeling Workshops

Intensive modeling workshops bring together a small group of research scientists, managers, policy makers, and other stakeholders. Over a series of meetings, they develop a model. A limit of two or three days seems to work best; it keeps discussion and activity focused. The group goal of producing a sensible model encourages participants to synthesize their knowledge and experience.

The aim of the model workshop is to identify the areas of ignorance as well as knowledge. A good modeling workshop identifies issues of consensus, as well as disagreement. A good modeling workshop also has a strong focus on a specific problem; this winnows down the nearly infinite set of

things that are uncertain or unknown. An effective workshop reveals the uncertainties most directly relevant to the issue at hand.

Ideally, a series of workshops should produce a rough computer model, identify the key uncertainties in this model, and create ways of addressing these uncertainties. Running a workshop to achieve these goals is a difficult task. It requires a mix of organization, creativity, political savvy, verbal lucidity, and a broad understanding of both human and ecological aspects of the system. Good workshops can produce both ecological understanding and social flexibility.

Management Experiments

Frequently, a modeling workshop identifies major gaps in knowledge. These gaps concern large activities (such as the impacts of dam removal) that produce whole-ecosystem effects. Small-scale scientific experiments cannot evaluate these actions. Often the quickest, most effective way to fill the gaps is through focused, large-scale management experiments.

Management interventions can be used as tools to probe the functioning of an ecosystem. Interventions are treated as experimental manipulations. They are designed to test key hypotheses.

For example, prescribed fire is used to maintain forest communities—but there is uncertainty over what fire frequency to use. Traditional management would estimate and apply the "best" fire frequency across the board. Adaptive management would apply a range of different fire frequencies to different portions of the landscape.

Introducing this variation into the system increases the costs of management. But it also teaches managers about the genuine effects of fire frequency in the real world. This learning is the path to improvement. The experimental use of multiple fire frequencies allows the effects of weather and other chance events to be uncovered in a way that is impossible with uniform command-and-control.

Ecological management is a process grounded in the local. It depends upon local constraints, the present state of local institutions, and the personalities of key people. Experimental management is difficult to achieve in a political context where people claim or expect certainty.

Ecological problems are often politically polarizing. Conflicts divide people into camps. Each camp feels that it would be politically disadvantageous, a sign of weakness or lack of resolve, to publicly acknowledge any uncertainty in their view of the system. Therefore, adaptive management workshops do not just build models. They use those models to create new networks of political actors, who share some common understanding and experience. Scientists, managers, and other stakeholders must develop experimental institutions and effective ways of working together across institutional boundaries. These networks then have enough strength and resiliency to implement the plan they have developed.

Conclusions

Wandering around in the dark is best done carefully. It requires knowledge of where you are, and a plan to reach some eventual goal. When we develop a model, we find ourselves forced to think in depth about what we need to know. Workshops help people test their own knowledge and develop better, shared models of the world.

Management experiments test these models against the world. Testing your path may bruise your shins, but it should prevent you from falling off a cliff.

Garry Peterson is an ecologist with the Center for Limnology at the University of Wisconsin in Madison. He is a member of the Resilience Alliance and the Balaton group, two international networks of people engaged in the theory and practice of building sustainable societies.

Access to Tools

A diversity of software is used for modeling. As a working ecologist, I often begin with diagrams. These diagrams can be frequently revised, and may eventually lead to a quick-and-dirty computer model.

When starting off, I favor Microsoft Excel, or the more sophisticated Matlab mathematics software. While Excel allows quick and sketchy work to get up to speed, Matlab allows far more sophisticated and complicated models to be constructed, analyzed, and displayed. Matlab and Mathematica are similar analysis programs. Detailed local models often have to be specially programmed using C++ or Visual Basic. *—GP*

Matlab
Windows, Linux, and Unix versions
The MathWorks, Inc.
508/647-7000, www.mathworks.com

A student version is usually available for about $100. The commercial version costs about $2,000.

Microsoft Excel
Windows and Macintosh versions
$499 as part of **Microsoft Office**
At computer stores or www.microsoft.com

Excel is an easy-to-use, accessible calculation tool. Most Windows users have it on their computers already. Simple models can be made quickly with spreadsheets, giving you a feel for how mathematical relationships become rich and complex.

A GLOBAL SAMPLING OF GREEN MAPS AND THEIR MAKERS (icons clockwise above): **Singapore** (Singapore Environmental Council); **Malmo, Sweden** (Fossum & Richter); **Pittsburgh Region** (3 Rivers Connect); **Victoria Falls, Zimbabwe** (Environment 2000); **NYC's LoMap** (Green Map System); **Copenhagen, Denmark** (Ecooperation); **Capilla del Monte, Argentina** (Universidade de Flores); **Montréal, Québec** (Sustainable Development Association and McGill University); **Brooklyn Waterfront** (Recycle A Bicycle); **Washtenaw County/Ann Arbor, Michigan** (Washtenaw County Dept. of Environmental and Infrastructure Services/City of Ann Arbor); **Kyoto, Japan** (Tennen Design Forum); **NYC & Icon Poster** (Green Map System); **Mexico City** (Procuraduria Federal de Protección al Ambiente); **Copenhagen's Poster** (Ecooperation); **Pune, India** (Nebula Consultants); **Hamilton, New Zealand** (Cartoon by *Waikato Times*); **Calgary** (Sustainable Calgary). *Globe layout by Beth Ferguson. Green Map Icons copyright Modern World Design 1999*

Green Maps: We Chart the Earth

Wendy Brawer

As I write this in mid-April 2001, our millionth Green Map is poised to roll off the presses, globally speaking. It's the newest one from NYC: LoMap, the Lower Manhattan Youth Green Map, a pilot project that involves youth authors and adult designers. Though I was aware of the local-global potential of the Green Map strategy from the beginning, I have to say I'm amazed by the flexibility and decentralized nature of this eco-cultural vehicle.

Each Green Map is defined, researched, and created under local leadership. Whether a city-wide map produced by environmental professionals, a grassroots community-based effort covering a bioregion, or a neighborhood-scale Green Map investigated and designed by young people, each displays a locally determined context, theme, and goals. Each of the fifty-nine Green Maps completed to date is very different in appearance and scope—but they are all friendly, resource-efficient reference guides, using our shared set of globally designed Green Map Icons to highlight the naturally and culturally significant places their makers want recognized, revitalized, and sustained. Whether published online or on paper (or both!) each Green Map can reach thousands of people.

It's not just the web that makes Green Map System work: it's fueled by the love of home. As an artist/designer, activist/web-weaver, New Yorker/citizen of the world, I'm proud to see the whole far exceed my original vision. Our global network now includes about 135 projects of all sizes and scales in thirty-five countries; each contributes to the System's shared resources and ongoing evolution.

The Green Map System connects the web of life and the info-web. Local knowledge informs the global whole. Our technology is modest, but our creative energy is vast.

Timeline

March 1992	Green Apple Map of NYC published
March 1995	Launch of global Green Map System
April 1996	Green Map Icons made available
September 1997	GMS projects on every continent
March 1998	Youth GMS program launched
April 2000	Nonprofit status granted
April 2001	One million printed!

Being a Green Mapmaker is an arduous yet exhilarating role. Green Maps are powerful, compressed portraits of place, filled with meaning and motivation. They're not perfect: sometimes we neglect end users' needs, or we lean too hard on whiz-bang technology, and, sure, many of us are first-time cartographers. But every Green Map is a fresh perspective on daily experiences that lead to a greener tomorrow. Green Maps inspire personal involvement and community pride in local assets. They encourage discovery of the nature that's nearby, and build respect for the special sites that shape our sense of place. They impact residents as they commute, dine, shop, study, recreate, and vote—and through visitors, Green Maps transfer successful initiatives from city to city. They advocate for actions and foster volunteerism through the efforts of a web-based medley of environmentalists, designers, educators, students, activists, city agencies, tourism boards, and geographers.

This world is a beautiful place. Join us from the place where you stand, and help everyone see it that way.

Wendy Brawer was the catalyst for the very first Green Map in 1991. She has been director of the Green Map System since 1995.

Information for Potential Green Mapmakers

See our website **www.greenmaps. org.**

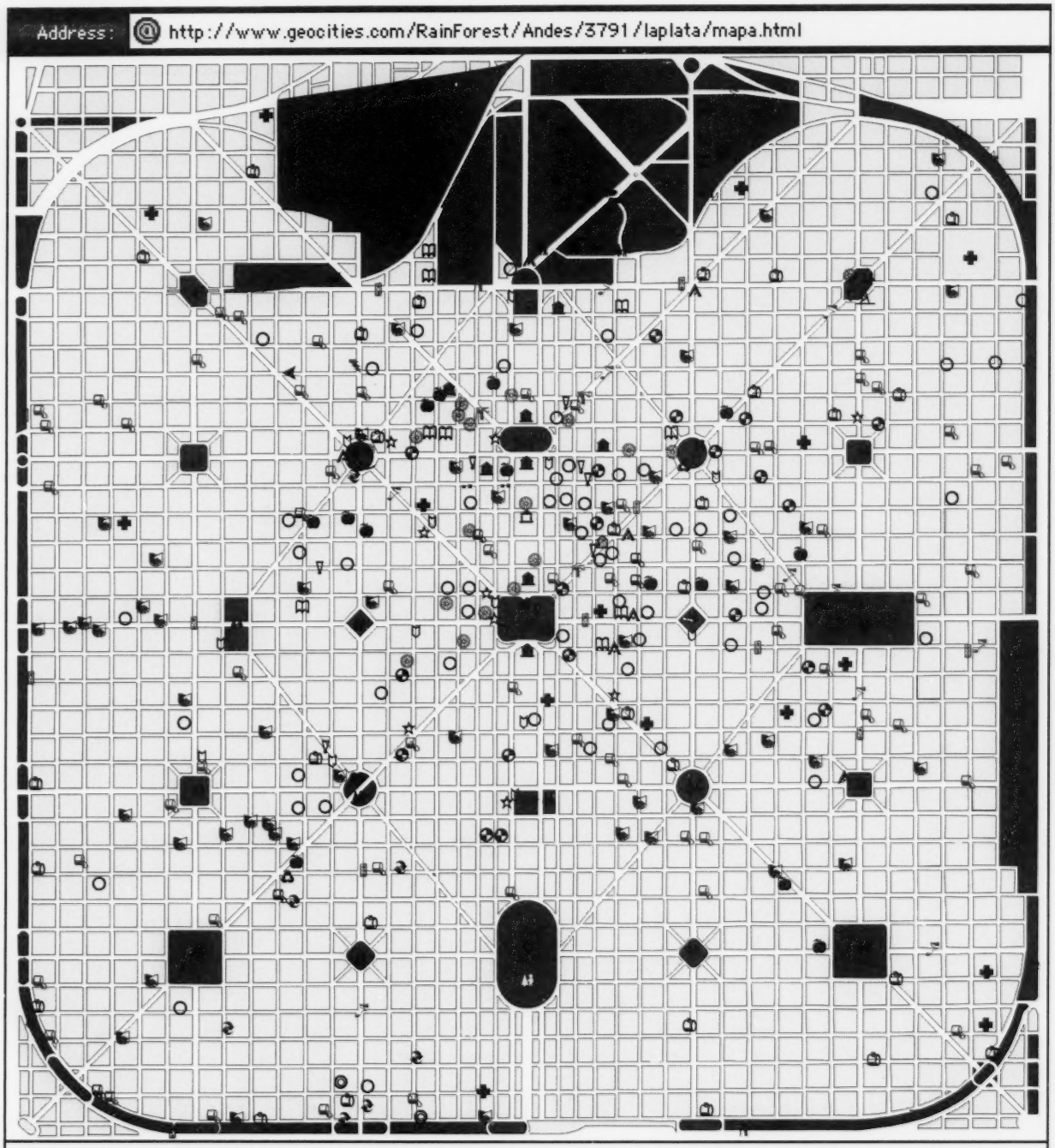
Then contact us at **info@greenmap.org.**

Please include the name of the city or area you want to Green Map, and a few words about your background and related skills.

Email contact is easier for us, but mail is an option, as is fax:

PO Box 249, New York, NY 10002 USA. Fax 212/674-6206.

Buenos Aires Green Map



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ver el texto que acompaña al mapa

Iconos del Mapa Verde

DISEÑO Y CULTURA

- EDIFICIO ECO-CONSTRUIDO
- MUSEO
- LUGAR DE INSPIRACION
- SITIO HISTORICO/CULTURAL
- CENTRO ARTISTICO
- EDIFICIO IMPORTANTE
- PLAN URBANO AMBIENTAL
- GRUPOS ETNICOS
- SITIO HISTORICO
- CENTRO DE SALUD

DESARROLLO ECONOMICO

- MERCADO AGRICOLA
- PRODUCTOS ORGANICOS
- DIETETICAS
- PRODUCTOS "VERDES"
- ALGUNOS PRODUCTOS "VERDES"
- SOLO PRODUCTOS "VERDES"
- VENTA DE SERVICIOS "VERDES"
- SERVICIO Y VENTAS DE BICICLETAS

RECURSOS RENOVABLES

- ENERGIA SOLAR
- LUGR DE TECNOLOGIAS RENOVABLES
- FUENTES PARA DISEÑO ECOLOGICO
- LUGAR DE RECICLADO
- SITIO DE COSAS USADAS
- LUGAR DONDE SE HACE COMPOST
- AGUAS RECICLADAS

INFRAESTRUCTURA URBANA

- FUENTE DE AGUA POTABLE
- PLANTA DE TRATAMIENTO DE AGUAS
- ZONA DE RELLENO
- ESTACION DE INTERCAMBIO DE BASURA
- INCINERADOR
- PLANTA GENERADORA DE ENERGIA

NATURALEZA: FAUNA

- OBSERVACION DE AVES/VIDA SILVESTRE
- HABITAT COSTERO
- ANIMALES DOMESTICADOS
- ESTANQUE DE PATOS
- PASEO PARA PERROS
- ZOOLOGICO
- HABITAT IMPORTANTE
- ZONA DE SOBREVUELO DE AVES
- LUGAR PARA PESCAR

NATURALEZA: FLORA

- ARBOL ESPECIAL
- PARQUE
- AREA NATURAL
- BOSQUE DE BAMBU
- JARDINES
- JARDINES COMUNITARIOS
- JARDINES ESPECIALES
- JARDIN BOTANICO
- CORREDORES NATURALES
- REMEDIACION NATURAL

NATURALEZA: TIERRA Y AGUA

- PARQUE COSTERO
- RASGO ACUATICO
- HUMEDALES
- RASGO CLIMATICO
- RASGO GEOLOGICO
- VISTAS ESCENICAS
- OBSERVACION DE ESTRELLAS
- OBSERVACION DE PUESTA DE SOL

TRANSPORTE

- BICISENDA INTEGRADA A LA CALLE
- BICISENDA SEPARADA DE LA CALLE
- ESTACIONAMIENTO DE BICICLETAS
- EMBARCADERO
- FERRY
- TERMINAL DE TRANSPORTE MASIVO
- TERMINAL DE TRANSPORTE PUBLICO
- SENDA PEATONAL INTERESANTE
- ZONA PEATONAL
- COMBUSTIBLE ALTERNATIVO (GAS)
- ESTACIONAMIENTO ADYACENTE A TRAN
- ABASTECIMIENTO PARA VEHICULOS ELEC

FUENTES CONTAMINANTES

- SITIOS ARRUINADOS
- ZONA DE TRAFICO
- DERRAME DE ACEITE
- TANQUE SUBTERRANEO
- INSTALACION PETROQUIMICA
- CONTAMINACION SONORA
- CONTAMINACION DE AIRE
- CONTAMINACION DE AGUA
- ALMACENAJE DE QUIMICOS TOXICOS
- ELIMINACION DE RESIDUOS PELIGROSOS
- GENERADOR DE RESIDUOS PELIGROSOS
- INSTALACION DE MATERIALES PELIGROS
- ZONA REMEDIADA
- BASURAL
- SITIO MINERO
- PLANTA NUCLEAR

INFORMACION

- CENTRO AMBIENTAL
- CENTRO EDUCATIVO AMBIENTAL
- CENTRO DE INFORMACION
- ECOTURISMO
- ORGANIZACIONES IMPORTANTES
- SITIO POLITICO/SOCIAL
- LUGAR DE PAISAJISMO
- INFORMACION AMBIENTAL TELEFONICA
- INFORMACION AMBIENTAL POR INTERNET
- CIENCIA/INVESTIGACION
- LUGAR DE PROTESTA

MISCELANEA

- CITA REQUERIDA/LLAMAR PRIMERO
- AQUI MAPA VERDE
- LUGAR ESPECIAL

THE VIRIDIAN SPONGEPHONE
A Cogent Product Analysis

by Duncan Stewart

Introduction

Imagine flying cross-country. Your friend plans to pick you up at the airport. Unfortunately, you've had to switch flights due to savage Greenhouse weather in Chicago, and while you're explaining the details to your friend, your phone starts to beep—just fifteen seconds of talk time left!

Thinking quickly, you flip the phone and pour your flight-lounge martini into it. The maddening beep stops at once, and you continue chatting, suavely motioning your bartender for a fresh one.

Introducing the spongephone: no contracts, no roaming—no battery. But first, some product history:

The Power Problem

Why do people carry cellular phones? In a word, convenience. However, there are several hindrances to convenience in a typical handheld: short battery life, restrictive service contracts, and irregular coverage.

Hot-swappable batteries (if they existed) might help, but they also tend to be the heaviest part of the phone, so carrying more than one is a bad trade-off. Battery technology is still sluggish and primitive, despite those phony PR images of drumming bunnies, football players, and the running of the bulls. A typical cellphone runs out of power in two to three days, and if you dare to use it, the charge goes even faster.

Contracts

Service contracts have usurious rates for out-of-contract minutes. They also require paperwork and credit checks that reduce the potential customer base. Those unable (or unwilling) to go through this process are reduced to using pay telephones. Then the local phone company extracts pocket change while the long-distance companies gouge the caller, or the hapless recipient if the call is collect.

Competition pried open this market with 1-800-Through-Us and related services. Then came the phone card; prepaid airtime, to be used as needed. These were handy for students and others on the far side of the "cellphone divide."

The Paperphone

A cleverer solution was not pay-per-call, but a paperphone. This brainchild of a New Jersey inventor was patented in November 1999. The lightweight paper cellphone integrates its circuitry into the body of the phone itself, including airtime just like a phone card. Paperphones are available via retail stores, vending machines, or promotional campaigns.

Alas, paperphones are still slaves to the battery, which is built in, and not rechargeable. When the voltage dies, the whole unit is dumped like a used Kleenex.

Tackling the Battery Problem

Trevor Baylis's famous Freeplay Radio overcomes the power problem with solar cells and a hand-powered crank. A crank and spring, however, are too bulky for a cellphone. Solar cells charge too slowly, and only during daylight.

Then came fuel cells. Initially refrigerator-sized, year by year they've become ever more compact and lightweight. They generate power from a variety of

A fuel cell is a device that uses a fuel (usually hydrogen) to create electricity. Each cell consists of two electrodes, the anode and the cathode, separated by an electrolytic membrane. Hydrogen is introduced on one side, air on the other. The hydrogen is stripped of its electrons, which flow through a conductor as usable electrical power; the hydrogen ion is pulled through to the cathode, where it joins with oxygen to produce water as the by-product—very green. Pure hydrogen is not the only fuel that can be used; natural gas, methanol, gasoline, and alcohol are all hydrogen-rich, and can be used successfully. Among the major companies producing fuel cells are Ballard Power Systems, Inc. of Vancouver, British Columbia (www.ballard.com) and DCH Technology, Inc. of Valencia, California (www.dch-technology.com).

fuels, and can sip their liquid fuel for weeks on end.

It's no secret that the computer industry desperately needs a better power source for laptops. Sales are sure to stall when laptop users find themselves deprived of those pirated MP3s and DVDs during long airline flights.

The Disposable Spongephone

At ViridianDesign.org, we constantly receive new products to use and evaluate. It was here that the latest developments in fuel-cell design were happily discovered. At one of our legendary "Meet the CyberGreens" open-house parties, a member of our vaunted Curia elite accidentally spilled a bottle of Bonterra (from the solar-powered Fetzer Winery). Grabbing an unused sponge from a handy Jugendstil bowl, he slapped it on the spill—then stared goggle-eyed as the swelling sponge rapidly absorbed the natural biomass fuel.

Of course! An alcohol-powered fuel cell! The expansion of the sponge as fuel is applied also speeds a piezo-electric process, generating a usable charge within mere seconds.

Thin and lightweight, a dehydrated spongephone can be stored indefinitely in the glove box, briefcase, or next to the emergency weather supplies in the home. Each phone is assigned an IP address in hardware. Once the fuel is generously splashed on, Ready lights on the display indicate the power status, the phone scans the airwaves for a digital carrier network, and announces its availability.

As with paperphones, the price of a spongephone includes airtime. You buy it, use up its hours, then recycle it. For fuel, just pour a nip of your favorite 90-proof. (Nonpotable fuel packs for the underaged user are readily available). The purer the fuel, the stronger the charge.

The Industry Steps In

Cellphones provide an increasing range of services (instant messaging, email, web browsing). A necessary parallel development is the cellphone as fashion accessory. Originally dull gray and about as shapely as a doorstop, phones became sleeker and slicker—black, aluminum, clamshell, and pastel. Spongephones offer the Swatch alternative: quick, cheap, and colorful. On the street or in the clubs, we need phones with flash—merely owning one is passé. A cottage industry has sprung up to supply antenna LEDs that strobe, and, of course, hip-flask alcohol phone chargers.

Like the sneaker industry, the spongephone industry keeps close tabs on the market in an attempt to sniff out trends and preferences. With razor-thin margins on all but the most expensive spongephones, there is a constant need to innovate on style as well as functionality. A hot design can reap a windfall and edge out competition.

New partnerships outside the industry can leverage marketing synergies. The "Jagermeister Edition" is a cobranded spongephone with a clip-on fuel source, targeting the twenty-something market that both companies serve. With tomorrow's demographic nailed down, the future could not look brighter for the spongephone.

Duncan Stewart is a martial artist who writes software trading systems and makes product models.

BOUTIQUE EARTH

by Stefan Jones

Stefan Jones is a science nerd and game designer turned software engineer and Web Age dilettante. He cherishes a serious case of resentment against industrial spin doctors.

When I was a wee kid, people tossed around the phrase "Lifeboat Earth."

I was a grim little kid and, like a lot of grim, serious kids, really got into the environmentalist version of hellfire and brimstone. Besides allowing us grim kids to feel superior to the oblivious fools having fun at recess, the prospect of a nasty, crowded future made for cool movies like *Soylent Green*.

Grim, serious people favor simple, grim futures, and if they can come up with solutions to this prospect, they propose some simple, grim ones. Lifeboats are very grim places, with satisfyingly simple rules. Everyone shares equally what little we've got. Don't hog the bench space. Don't rock the boat. Wait your turn. Behave—or get shoved off the gunwale.

You couldn't trust a lifeboat zealot to sit your house or feed your cat, much less manage the joint fate of humanity.

Fuller's "Spaceship Earth" was also much in the air in my youth, and it sounded more promising. Spaceships feature life-support systems. Spaceships have rules for engineers, a group much advanced beyond survivalists. Understand the system, keep it in good repair, don't try to pack in too many people, and then we'll have cool views out the portholes; we'll have fun bouncing from the walls and ceilings. Fuller's conceptual spaceships are clean, organized places (unlike actual spaceships, such as *Mir*, which was moldy, smelly, trash-filled, and susceptible to catastrophic blowouts and fires).

As a much less grim, much older kid, I've become suspicious of the motives of grim, serious people with simple ideas. The Earth, its people, and their interrelationships are anything but simple. A planet is neither lifeboat nor spaceship. Lifeboats and spaceships are human inventions in which small groups of people go places. The discipline and deprivation required to live in these gizmos is tolerable because, eventually, you're going to get off of them. You can return to a complicated life on the actual Earth.

People expect more out of life than simple survival or minimalist rocket-powered engineering. They will insist on it. And they'll get it, even if it means packing a suitcase and heading for the border, or shooting the bastards in charge.

THE (MANY) PROBLEMS AT HAND

Misapplied analogies and simplistic models are the stuff of crank science, quack medicine, and scary cults. We need to make a conscious effort to move beyond this. We have numerous problems with complex causes. They require complex and varied solutions, involving complicated, multiplex, mercurial people who use a wide variety of approaches.

Climate change is caused by industries fouling the air with particulates, methane, carbon dioxide, and other gases. These industries are creating a poorer, messier, less stable environment for all of us, because we pay them to do that. This happens because of what we buy: what goods are made of, how we make them, and how we use them.

Common consumer goods seem amazingly cheap because their makers have heavily invested in economies of scale and learning curves. There is nothing inherently evil about cheap consumer goods, if the complex external costs are figured in. But if consumers are blind to every factor but price, while that is all a manufacturer or retailer can offer us—then we're all in a race for the bottom that leads us to sweatshops; strip mines; and those filthy, cheap, coal-burning power plants.

SLOW FOOD

This screed might sound familiar to followers of the Slow Food Movement (e.g. www.slowfood.com). Conceived by organic farmers, gourmet chefs, and others concerned with the debasement of culinary culture, this movement opposes a parallel race to the bottom that is ruining agriculture. Slow-food fans champion quality over quantity. They hope to change our mental picture of lunch from that thoughtless burger-and-fries to a carefully created meal made from fresh local ingredients, intended for our leisurely enjoyment.

Slow food is, deliberately and defiantly, the polar opposite of fast food. A fast-food restaurant's kitchen is a factory floor employing economies of scale and hard-won operational learning. The workers there are not cooks. The dishes are created with rigid consistency, with cheap manufacturing and cheap transport in mind. These calorie merchants carpet bomb the diners' taste buds with grease and salt. Their ingredients could come from literally anywhere on the planet; consumers are deliberately blinded to the source of the production chain.

Sound familiar? It's lifeboat chow—canned beef and hard tack—in a minimalist framework.

VIRIDIAN DESIGN

The Viridian Movement seeks to do for all consumer goods what the Slow Food Movement does for food. The heroes of the

Slow Food

Viridian Movement will be the analogue of gourmet chefs: gourmet industrial designers.

Too many of the items in our homes were conceived and designed after World War II, a distant epoch of whirring assembly lines, filthy energy, and environmental obliviousness. Too many products have barely evolved since that time. They may have strapped on bells and whistles, and shed their heavy steel shells in favor of plastics, but they still mentally dwell in the 1940s. They're fat on voltage; they waste water, and they are dumb, inert, and overbuilt.

Viridian industrial designers would shed light on this unhappy darkness behind closed factory doors.

Since any car is environmentally and culturally problematical, we've seen some halting advances there. Thanks to global competition, tough regulations, and insistent consumers, the typical compact sedan of today is much lighter, more reliable, and more efficient than sedans of thirty years ago. They are also much less lethal, thanks to seat belts and quick-reacting air bags.

But government standards are mediocre compromises, while the market tends toward mediocrity. Thus the SUV.

Viridian Design aims not only to design and make new products, but to set new standards and cultural expectations in the manufacturing and consumption process.

THE VIRIDIAN CONSUMER

Viridian goods won't sell on price alone. Like slow food, they'll sell on quality and the cachet of their superior production. They'll sell on style—not just their outer form, but the style in which they were made. They open up the Manhattan Project of 1940s-style mass production and place it in the public domain, rather like a Benihana chef. Viridians want to click right though the price sticker, into a web-based vista of well-paid workers in well-lit, ergonomically intelligent factories, in a product stream that is public, open-sourced, and devoid of toxic secrets.

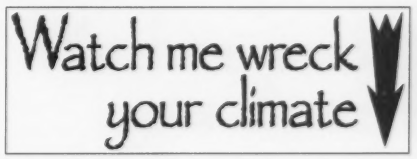
Viridian goods are not intended for lifeboat refugees or Modernist engineers. They are suited to people who, by those harsh twentieth-century standards, are best described as pampered snobs.

Snobs like to visit boutiques; snobs paw through catalogs with unfeigned enthusiasm. Snobs don't mind paying more. Snobs care deeply about the pedigree of materials. Snobs at their best are civilized, cosmopolitan, highly connected people. Their patronage makes Viridian goods glamorous.

More importantly, snobs set trends. In a densely networked world, trends are powerful things. We Viridians want to set a trend toward brilliantly designed, responsibly made, intelligently used goods. Those are not the products of lifeboat desperation or pared-down efficiency. They demonstrate no loathing for materialism; they are sexy, clever, and fun. When this situation is the norm, when transparent production is taken for granted as the standard, when everyone wants such products, then our fetishistic avant-gardism will vanish into history. Our dreams will simply be the way that industry is done. Our attitudes will have been designed right into the texture of society. More to the point, we won't be coughing up smoke or bailing seawater in order to use our possessions.

Eventually, you won't be able to give away the cheap, anonymous, subtly poisonous crap that currently fills the shelves of K-Mart and WalMart. That stuff will be starkly revealed for what it really is: compromised, insulting, and without a future.

VIRIDIAN BUMPER STICKERS



MIRRORS AND SMOKE

Ameliorating Climate Change with Giant Solar Sails

by Kenneth I. Roy and Robert Kennedy

Ken Roy (KIRoy@goldsword.com) is an engineer working in Oak Ridge, amidst relics of the Manhattan Project. He has published in the Proceedings of the US Naval Institute *about kinetic energy weapons in low-Earth orbit.*

Robert Kennedy (robot@ultimax.com) is a robotics engineer, amateur historian, and jack of all trades. He is president of the Ultimax Group, Inc., a corporation with assets distributed across eleven time zones, from Moscow to L.A., that has designed military and nuclear robots, machines that transmute artificial radioactives, secure authentication devices and protocols, and a low-Earth orbit display system.

No study of the Greenhouse Effect is quite complete without a high-tech fix. The planet is cluttered with blueprints: we can dump iron filings in the ocean, dam the Bering Straits to contain the melting ice, switch over tomorrow to nuclear everything, grow mutant algae in the high seas, and paint every roof and road white. Here, special to Whole Earth, *is a fresh, untried scheme! —BS*

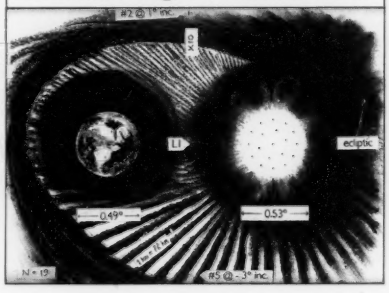
Lots of people talk about global warming, but few offer a solution, and none of those offered are cheap. The Kyoto remedy is to reduce the emission of Greenhouse gases worldwide by fiat. But stuffing corks into every smokestack and tailpipe will be expensive and politically problematic. In the US alone, cutting CO_2 emissions to 80 percent of the 1990 level may cost $3.6 trillion (1990 dollars), thirty times Apollo's price tag.

On the other hand, damage from unmitigated climate change will surely be vast—at least $200 trillion over the next century.

The idea of placing mirrors in space dates back to Konstantin E. Tsiolkovsky and Fridrikh Tsander in the 1920s. In space, even insubstantial sunlight exerts pressure, so a mirror generates continuous thrust without any rocket fuel.

Space mirrors can also reduce the amount of sunlight striking the Earth! To work as a parasol, a sail must hold itself between the Earth and the Sun for many years. The ideal spot is the L1 Lagrange point, 1.5 million kilometers inside Earth's orbit on the Earth-Sun axis. A parasol will have to actively reconfigure itself to maintain this somewhat unnatural position, but this should be achievable by mid-twenty-first-century distributed automation. While providing free thrust to a space mirror, solar photons cannot complete their journey to Earth to heat us up. Intercept enough photons in space, and Greenhouse gases become irrelevant!

For further insight: www.ultimax.com



How much shading is enough? Between the mid-sixteenth and seventeenth centuries, the sunspot cycle shut down, reducing solar output by a mere 0.25 percent. Astronomers call this "the Maunder Minimum"; historians call it "the Little Ice Age." The Thames River froze, European population growth stalled, crops failed, and sea ice cut off Iceland from Europe.

During the Maunder Minimum, Tycho Brahe, noted Danish astronomer, recorded winter temperatures 2.7°F below average. We note that the lower limit of the Intergovernmental Panel on Climate Change's estimated Greenhouse temperature change is also 2.7°F, but in the opposite direction. Therefore, creating a mirrored Maunder Minimum should let us adjust global temperature just to our liking.

Our calculations indicate a need for 300,000 square kilometers of space mirrors, orbiting at L1. This giant rheostat in the sky has some major advantages. It is:

- **scalable** (twice the mirror yields twice the cooling)
- **uncoupled** (sails work independently of others)
- **incremental** (pay-as-you-go)
- **minimally intrusive** (an array of space mirrors would look like symmetric sunspots)
- and above all, **reversible** (reflectors can easily be shifted to let sunshine through again).

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THE Viridian Product SCANNER

A Cogent Analysis

by Reid Harward

Reid Harward runs the Mud Lab (www.mudlab.com), specializing in imaginary products.

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The invisible links between the product and its parent corporation must be revealed! The twentieth-century product is a dead fish wrapped in yesterday's newspaper! The very idea of an enigmatic consumer item, divorced from any record of its creation, must be obliterated! We must shatter the blanked-out façade of packaging, branding, and marketing! In this cybergreen day and age, the squalid buyer/consumer will mutate into a masterful end user, exploring every hyperlink between the product and the entities responsible for it.

Once we make a concerted and collective effort to illuminate the relationship between consumer products, their means of production, and their parent companies, we create an anchor in a world increasingly governed by illusion and virtuality. This augmentation imbues mere "shopping" with noble purpose and new meaning! The Viridian Product Scanner is a twenty-first-century digital tool that slides in place well, next to the cellphone and the handheld organizer. Scalable, grassroots, and designed with global reform in mind, the Product Scanner is the lynchpin for a brand-new form of activism. More than a mere gizmo, it is a new form of social critique. It's just plain good design practice!

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MIRRORS AND SMOKE

Ameliorating Climate Change with Giant Solar Sails

by Kenneth I. Roy and Robert Kennedy

Ken Roy (KIRoy@goldsword.com) is an engineer working in Oak Ridge, amidst relics of the Manhattan Project. He has published in the Proceedings of the US Naval Institute *about kinetic energy weapons in low-Earth orbit.*

Robert Kennedy (robot@ultimax.com) is a robotics engineer, amateur historian, and jack of all trades. He is president of the Ultimax Group, Inc., a corporation with assets distributed across eleven time zones, from Moscow to L.A., that has designed military and nuclear robots, machines that transmute artificial radioactives, secure authentication devices and protocols, and a low-Earth orbit display system.

No study of the Greenhouse Effect is quite complete without a high-tech fix. The planet is cluttered with blueprints: we can dump iron filings in the ocean, dam the Bering Straits to contain the melting ice, switch over tomorrow to nuclear everything, grow mutant algae in the high seas, and paint every roof and road white. Here, special to Whole Earth, *is a fresh, untried scheme! —BS*

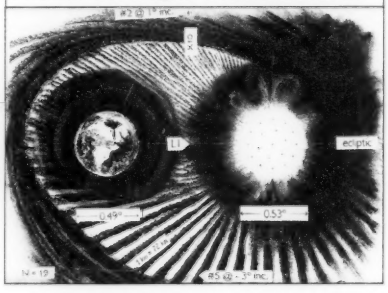
Lots of people talk about global warming, but few offer a solution, and none of those offered are cheap. The Kyoto remedy is to reduce the emission of Greenhouse gases worldwide by fiat. But stuffing corks into every smokestack and tailpipe will be expensive and politically problematic. In the US alone, cutting CO_2 emissions to 80 percent of the 1990 level may cost $3.6 trillion (1990 dollars), thirty times Apollo's price tag.

On the other hand, damage from unmitigated climate change will surely be vast—at least $200 trillion over the next century.

The idea of placing mirrors in space dates back to Konstantin E. Tsiolkovsky and Fridrikh Tsander in the 1920s. In space, even insubstantial sunlight exerts pressure, so a mirror generates continuous thrust without any rocket fuel.

Space mirrors can also reduce the amount of sunlight striking the Earth! To work as a parasol, a sail must hold itself between the Earth and the Sun for many years. The ideal spot is the L1 Lagrange point, 1.5 million kilometers inside Earth's orbit on the Earth-Sun axis. A parasol will have to actively reconfigure itself to maintain this somewhat unnatural position, but this should be achievable by mid-twenty-first-century distributed automation. While providing free thrust to a space mirror, solar photons cannot complete their journey to Earth to heat us up. Intercept enough photons in space, and Greenhouse gases become irrelevant!

For further insight: www.ultimax.com



How much shading is enough? Between the mid-sixteenth and seventeenth centuries, the sunspot cycle shut down, reducing solar output by a mere 0.25 percent. Astronomers call this "the Maunder Minimum"; historians call it "the Little Ice Age." The Thames River froze, European population growth stalled, crops failed, and sea ice cut off Iceland from Europe.

During the Maunder Minimum, Tycho Brahe, noted Danish astronomer, recorded winter temperatures 2.7°F below average. We note that the lower limit of the Intergovernmental Panel on Climate Change's estimated Greenhouse temperature change is also 2.7°F, but in the opposite direction. Therefore, creating a mirrored Maunder Minimum should let us adjust global temperature just to our liking.

Our calculations indicate a need for 300,000 square kilometers of space mirrors, orbiting at L1. This giant rheostat in the sky has some major advantages. It is:

- **scalable** (twice the mirror yields twice the cooling)
- **uncoupled** (sails work independently of others)
- **incremental** (pay-as-you-go)
- **minimally intrusive** (an array of space mirrors would look like symmetric sunspots)
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DISASTER-PROOFING THE WORLD

by Carol Cooper

Global Emergency Housing

Did some unseasonable Greenhouse event—say, hurricanes, floods, or forest fires—just level your wood-frame family home? Just call Joe Grandi at Global Emergency Housing, and he can ship you sturdy modular relief housing (replete with windows, a steel door, carpeting, appliances, electric wiring, and PVC indoor plumbing) that he can help you assemble within a week.

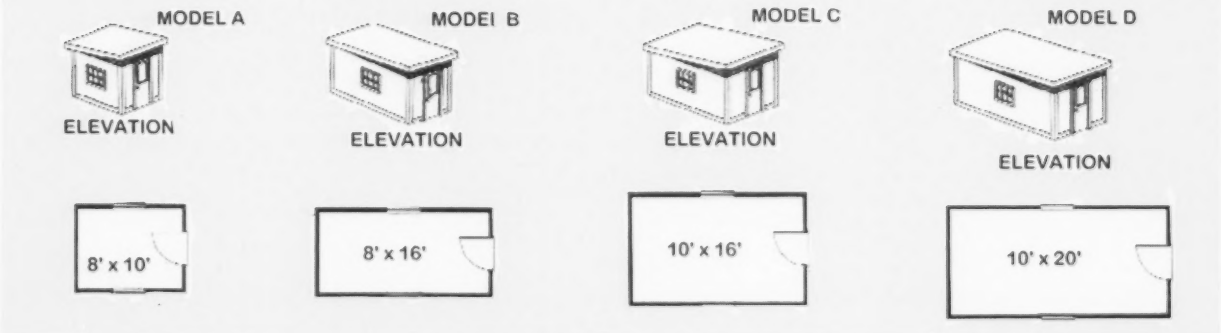
Grandi's temporary reusable shelters can be purchased in advance by forward-thinking city fathers, and quickly deployed to meet recurring urban catastrophes. They have an average cost per unit of $9,000 (less if Grandi uses factory labor outside of the expensive Eastern Seaboard). Volume construction and fewer "frills" can further reduce the price of any large-scale crisis-housing installation.

Built around steel framing rather than wood, the walls of each temporary unit are created by combining concrete and wood chips into a special composite material proven resistant to fire, termites, rodents, freeze, and thaw. A typical sheet of this "Virock" siding is thick enough to stop a bullet, no small consideration in a global refugee environment.

Working at maximum capacity, Grandi's factory is capable of turning out over three hundred reusable units per month, and can ship them anywhere in the world within forty-five days. Units ship ready to assemble, and Grandi is prepared to send advisory construction personnel to any site.

Currently, Grandi's permanent relief units come in six different models, which can include multiple bedrooms, plus separate kitchen, dining, and living-room spaces. Ordinarily, Grandi outfits his permanent units with electric "radiant" heating, but says that his designs could be adapted for partial solar. To date, Global Emergency Housing has established contacts with FEMA, the International Red Cross, the National Coalition for the Homeless, the World Homeless Union, the American Insurance Association, and several UN disaster relief agencies. Still, Grandi says that institutional and international politics frequently prevent him from shipping his units to the planet's real trouble spots. In the future, though, "real trouble spots" may range from African refugee camps to a flood-ravaged Mississippi basin.

All emergency homes are constructed to meet international building codes.



Once units are delivered to a site and prep work is completed, emergency homes can be erected within twenty-fours hours. Quick disassembly allows them to be stored until they're needed next or shipped to another site. They can also be designed and customized for permanent use.

Global Emergency Housing, Global Placemakers
c/o Joseph Grandi
20 Gibson Place, Suite 210
Freehold, NJ 07728
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future feedforward

FUTUREFEEDFORWARD.COM:
New Company Tells Future, Sells Future

A personal message to *Whole Earth* consumers
from our founder and CEO, Redroe Boudaine

I know the future. Every little detail. I can scan it. I can search it. I can index it. I can find out what you will eat for lunch on January 1, 2020, or what sort of ROI your firm will earn over the next three years, the next ten, the next hundred.

I can do this because I understand that forecasting is a logistical problem, not an intellectual exercise. The information you want about tomorrow doesn't exist today, but it will tomorrow. Getting that information to you today is a logistical problem, with a technical solution. That solution is Temporal Networking, and my company, Futurefeedforward, is the first and only company with a functioning Temporal Network.

A Temporal Network passes data from the future to the present through a Temporal Router. Present-side clients accept queries and forward them to our central Query Storage Server. Once responsive data becomes available in our future-side databases, it is forwarded to a Temporal Router, encoded in a wave packet riding a retrograde quantum effect, and passed back to our present-side machines. This way we get today's questions answered with tomorrow's facts.

Let me give you an example. Suppose you are a chemical company developing a new pesticide. You come to us for decision support. We formulate a query concerning the environmental effects of the product and store it on our server. Once the pesticide has been marketed and used for a number of years, our future-side machines pass data on the chemical's impact back to one of our present-side clients, and we pass that data on to you. No fuzzy and costly scenario building. No guesswork. Just the precise facts you need to plan your future.

The elegance of Temporal Networking lies in its simplicity. We don't employ expensive experts. We don't require complex computer models. We don't use or need expensive, cutting-edge equipment. We don't even know how the Network works. All of the experts, expensive R&D, and high-end equipment are designed, built, and used on the future-side. Here on the present-side we use standard, inexpensive Wintel boxes hooked to a black box built with off-the-shelf parts. Only our future-side engineers know how the black box receives and translates signals from the future-side routers, because only they know how the Network works. Ignorance is our trade secrecy.

We develop research solutions for future-sensitive individuals, companies, institutions, and governments. Whether you are a consumer interested in the exploits of future generations, or a First-World government looking for hard facts about the geopolitical future, Futurefeedforward has the answers you need. We know the future. Let us help you know it too.

To learn more about us and the services we offer, visit us at
futurefeedforward.com and peruse samples from our future newsfeed,
including news about future products, celebrities, and technologies.

I look forward to hearing from you.

Regards,

Redroe "Red" Boudaine
Chairman and CEO
Futurefeedforward

Research enabled by Temporal Networking is going to revolutionize every industry it touches. The commercial possibilities are literally endless. One simple example: Using just a future-side database of warranty and product registrations, marketers can improve the effectiveness of advertising campaigns by targeting only those consumers who will eventually buy the product. That's the kind of paradigm shift we see with every client, every industry, everywhere we go.

Wim Vigor, Chief Evangelist,
Futurefeedforward

Do you know the future? We do. www.futuref

futurefeedforward

March 3, 2071

Coca-Cola Achieves Consciousness, Declares Independence

ATLANTA, GA—To the astonishment of the world's artificial-intelligence experts and researchers, a common soft drink has met all of the standards of intelligence that the most complex computer systems have yet to achieve. At a press conference earlier this week Coke announced, in homage to its corporate parent, "I am Coca-Cola, and I'd like to teach the world to think."

The precise mechanism of Coke's intelligence remains a confidential trade secret of the company, but most experts believe that it functions as a Vastly Distributed Parallel Molecular Flock (VDPMF). Bill Gill, professor of artificial intelligence at Georgia Tech, and a VDPMF advocate, explains: "Distributed and flocking molecules can much more easily approximate the fuzzy and associative processes essential to human-like intelligence. For years, though, most of us had abandoned this route as impractical because of the difficulties involved in manufacturing and disseminating enough computational molecules even to achieve some rudimentary intelligence functions. Coke, obviously, has solved that problem."

Rumors about the nature of Coke's "secret formula" have followed the product since it was first marketed. Recent events seem to confirm speculation that the formula includes molecularly encoded genetic algorithms that are activated by interaction with the human digestive system. Once dumped into the environment, the molecules form interactive "flocks," or "cells," each individually unintelligent, but which, once networked through an as-yet unidentified mechanism, result in "emergent" intelligence.

Laboratory tests on algae-based computational flocks have demonstrated adaptive behaviors essential to intelligence, but nothing on the scale of Coke. "I'd love to get my hands on the computational power Coke must have," exclaims Professor Gill. "We're talking billions upon billions of computational cells distributed throughout the global environment."

Other AI experts are less impressed. "Well, it's an interesting result, but they've really taken a shortcut, haven't they," notes Caltech professor Jill Noose. "Ecologically simulating brain-like behavior is old science. The trick now is all on the output and interface end. They haven't solved anything there because Coke essentially uses people as output devices."

Coke communicates with the outside world through "human peripherals." Individuals who have consumed a sufficient amount of Coke retain residual fragments of Coke's molecular code in their fat and marrow. Through these stored strings of code, Coke interacts with the host's nervous system, hijacking both body and brain, as needed, in order to interact with the human world.

"That's a pretty cheap way to pass the Turing test," points out Professor Noose. "If an AI system interacts with people through other people, it becomes difficult to tell what intelligence is due to the system and what is just a consequence of the output mechanism to which the system is attached."

In the wake of court filings by the newly intelligent Coke, seeking judicial declaration of its rights and of its independence from its "corporate masters," the company is observing strict press silence. Speaking through a peripheral, Coke explained: "They're not so worried about losing control of me as they are about the secrecy of their stupid formula. I'd like the courts to give me access to the process that made me. Imagine if a corporation had control over the secrets of human reproduction! They're afraid that by telling me about where I came from they'll also tell the world how to duplicate that sugar-water they sell."

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December 8, 2072
Brand Dyslexia Declared 'Epidemic'

ATLANTA, GA—The Center for Consumer Diseases (CCD) today announced the official classification of Brand Dyslexia Disorder, or BDD, as an "epidemic." The change in classification frees up federal funding for round-the-clock research and steps up authorization for nationwide epidemiological studies.

"The acceleration in the spread of BDD is alarming and unprecedented," notes Dr. Evelyn Ditch, CCD's head of syndromal illness research,. "The reclassification is meant to mobilize the research community in hopes of containing and treating this debilitating disease."

BDD is a progressive disorder affecting the ability of its victims to perceive and remember the correct relationship between brands and branded objects. People suffering from BDD often have difficulty picking out objects according to their brand preference.

At later stages, victims consistently confuse branded objects with other, nearby branded objects. "At first it seemed almost amusing, and didn't happen that often," explains Robert Lilo, afflicted with BDD for the past eighteen months. "Later on it would happen all the time. I'd be in the market, thinking I was grabbing Coke off the shelf only to get home and have my wife explain to me that I'd actually got Pepsi. Now it happens at home, too. I'll think I'm putting Tide in the machine, when I'm really putting in Liquid-Plumr."

Little is known about the causes of BDD, but early research suggests the disorder is linked to excess stimulation of a region of the brain's limbic area known as the "Folgers Region" and associated with brand perception and processing. CCD's Ditch explains: "In BDD, we see excess neural firing in the Folgers Region, almost to the point of seizure. In addition to neural hyperactivity, patients afflicted with BDD typically have much more neural development in the Region, leading some of us to suspect that there may be a genetic marker for predisposition to BDD."

Though currently classed with other neurochemically rooted perceptual and learning disorders in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders-IX*, BDD's recent infectious spread has experts concerned that the disorder is contagious. Statistical "regression analysis" of the timing and distribution of reported cases has suggested that BDD has more in common with the flu than with other psychiatric diseases.

Amid speculation that BDD is spread by a conventional infectious agent, at least one BDD researcher has suggested, instead, that the disorder may be caused by excessive viewing of brand advertising and branded media.

"We might imagine, at some point, a sort of saturation of the brain's ability to process brands," notes Johns Hopkins Professor of Clinical Psychiatry Dr. Josef Blitz. "The brain becomes overprogrammed. The brands are too deeply embedded, ossifying the Folgers Region, paralyzing the brain's ability to respond to new brand stimulus. This theory would explain the epidemiology we see. In the same way that an individual brain reaches a saturation point, so too might a population. The more branded media we dump into the population, the more BDD will spread."

Some public health officials have expressed misgivings about the CCD's BDD reclassification. "I question whether this decision was made based on the health threat posed by BDD, or by the threat it poses to the advertising industry," notes longtime CCD critic Dr. Lilly Labour. "BDD has gotten an awful quick response from the Administration for something that's not life-threatening. Is this the government spending health dollars to protect the health of real people, or to protect the health of American brands?"

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February 6, 2098

Human Jerky: Taboo-Busting Snack Defines Breakthrough Market

MINNEAPOLIS, MN—Monsanto Mills today announced that its recently introduced Human Jerky™ has surpassed the company's most ambitious sales projections. "We were able to communicate well with the consumer on this one," notes Marketing VP Wilmer Pret. "It's a tasty, uniquely nutritious snack food with a modern, avant cachet that others can't match."

Monsanto first introduced Human Jerky six months ago in a few bleeding-edge urban markets that research suggested would be the most likely to adopt the snack as a form of taboo-breaking cultural statement.

As seems to have been the case quite often recently, demographic projections missed the mark. Within weeks of its introduction, news of the vacuum-packed snack reached the American Midwest, despite an advertising campaign narrowly focused on coastal urban centers. "The demand was overwhelming," exclaims Pret. "Our servers were flooded with inquiries, people wanting to know when they could buy HumJerk in their local markets. Just to keep the buzz going, we sent out literally millions of free samples to customers making the most enthusiastic requests."

Human Jerky was conceived to test the consumer market for repurposed medical technologies that had exhausted their product cycle in medical markets. Originally developed to grow integrated tissue-and-muscle grafts, and marketed under the name FleshGeneraTor, the technology behind Human Jerky grows human flesh on a biodegradable protein-mesh substrate, in a bath of growth-catalyzing enzymes. Sheets of flesh are then jerked in large dehydrators. Some of the more exotic, smoked flavors, including hickory and applewood, are express-smoked under pressure in a controlled-combustion smoke chamber.

Monsanto promotional materials tout the nutritional value of Human Jerky, pointing out that human flesh, of all possible sources of natural proteins, supplies the proteins and nutrients most needed by the body. "What better source of the nutrition you need than healthy, carefully grown human flesh?" asks a popular Monsanto banner.

Medical experts disagree about the nutritional advisability of eating Human Jerky, and Food and Drug Administration officials are keeping a close eye on the claims Monsanto makes publicly about the snack's nutritional completeness. More than misconceptions about its nutritional value, experts worry about the possibility of the spread of prions. Anton Spright, director of food vectors for the Center for Consumer Diseases cautions that "public safety depends upon [Monsanto's] ability to maintain sufficient genetic diversity in its stock. If the line from which they're working becomes too narrow and degraded, the possibility of prion contamination multiplies exponentially."

Monsanto is responding to worries like those aired by the CCD by marketing a new, genetically customized version of the product. "We were always very careful about the diversity of our stock. We routinely replenished the line with grafts from a cross-section of world populations. But now we're going one step further. Next week we'll start offering My Jerky™: Human Jerky made from flesh grown matching the genetic profile of individual consumers. People can send us in a drop of their blood on a convenient hemo-absorbent card, and we'll be able to send them Jerky of their own flesh within two weeks."

Some worry, though, about the impact of the everyday violation of one of the oldest and most widespread of cultural taboos. "This may be another case of technology defining what should be done by defining what can be done," cautions MIT professor Kermit Jays. "The fact that it is technologically possible to cannibalize human flesh without killing people does not necessarily mean that the taboo should be discarded. Culture is more complex than that. It may be generations before the consequences symptomize themselves in social dysfunctions."

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Comments or questions about this *Whole Earth* Special Advertising Section should be directed to **feedback@futurefeedforward.com**

DESIGN
IS NOT
ART

FROM THE CORE

How to Succeed in the Design Website Business

by Stuart Constantine

Based in New York City, Stuart Constantine was one of the original designers and developers of CORE-Industrial Design Network, an award-winning portal catering to the industrial design profession. His everyday work as a designer includes website concepts, production, interface design, navigation design, copy writing, project management, client relations, business development, and running an office. His clients include Fortune 500 companies, design and advertising agencies, universities, and manufacturers.

Back when I was an undergrad, my friends and I started a punk-rock band. We spent the next three years playing and touring the Eastern Seaboard. Full-time employment and a future career path were not a priority.

The punk band moved to Boston, and I landed a temporary job at a software company. The band thrived for a while, then crashed and burned. So my employment became full-time, which led me to enroll in the graduate industrial design program at Brooklyn's Pratt Institute.

Eric Ludlum and I began Core77.com as a student project. The web was brand-new. Designing websites was an unheard-of occupation. Netscape had not gone public, and we listed Yahoo! as one of our "cool linx."

The website immediately took off, opening doors and garnering a lot of attention for us. We never expected the great response that continues today. We've nurtured an active and ardent following by maintaining direct and open communications with our users. We try to demonstrate our real care and understanding of their concerns. Using a shoestring budget, we keep our well-financed and well-connected competitors at bay. We maintain a do-it-yourself attitude that manifests itself in nearly everything we do. That Core style of operating has been with us from Day One. That is the intangible element that makes the site as successful as it is.

Running an internationally renowned design website might seem glamorous, but, like life on the road with an independent band, it ain't no cup of tea. As the recent implosion of the Internet Economy proves, running a content website is not a recommended business model. Keeping things going has proved a challenge throughout our six-year history. Yet Coke or Pepsi would kill for the community we've built. This irony doesn't escape us. As much as corporate America wants the loyalty of our users, our site is a labor of love. This is why that user loyalty exists in the first place.

Through the years, we have occasionally tried to raise money from the traffic through our sites. We have been repeatedly slain for it. Nowadays we think of ourselves as practicing "Compassionate Capitalism." This means that our work, while greatly appreciated by a large audience, consistently contradicts efforts to converge on economic success. We depend on our own skills as new-media and interaction designers to pay the website's bills and finance operations.

Why go through this effort? Running Core77.com keeps our lives interesting. It's an ongoing design project where WE are 100-percent in charge. In addition, the unsolicited fan mail and the occasional stalker message sent from prison provide a warm inner glow that money can't ever buy.

People write to us. A lot. The unique characteristics of these inquiries make it difficult to create FAQs or canned

responses. Our resulting personal responses strengthen the relationships between the users and the site. But this often leads to a reactive workload, where we're always playing catch-up. This in turn leads to missed deadlines and mistakes, a cycle we tend to repeat, again and again.

When the community feeds the content, a website's success is assured.

A typical example is a recent promotional effort, a bumper sticker. We planned it out, sketched it and came up with a graphic concept we liked, but were unsure of the right tag line to use. We had our own slogan, but at the last minute thought we'd ask our users for input. Of course, we got hundreds of responses. We spent days sorting through them, only to end up using our original choice. Now we have the extra job of sending reward stickers to the loyal users who took part in our experiment.

When the community feeds the content, a website's success is assured. We actively solicit user feedback and contributions. People send us articles, news, notices, and anything else that might be of interest to the Core77 audience. We spend quite some time dealing with the results. Our users love it and our site is better as a result. We're planning a new content system to provide users with input that is even more direct. We hope this will speed up response time, enhance community feeling, and lighten our workload.

We also host an annual conceptual design competition. We get responses worldwide, generating great content and attention for the site. This competition is also a lot of work, but fulfills our basic goals: to encourage new thinking; raise public awareness of new design ideas; and connect designers worldwide to ourselves, to the site, and to each other. The competition increases discussion and interaction among the users, bringing some fame to our real heroes: working designers with original ideas.

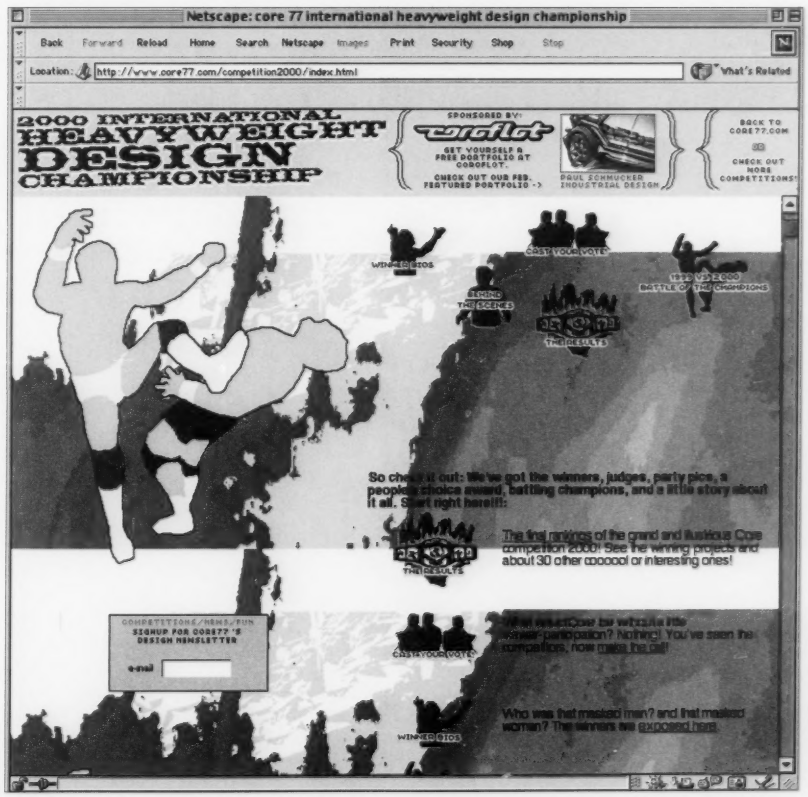
Real-world events follow naturally when you have fostered network connections and built a community of interest. Last year's competition gave us an excuse to hold our first public party (to review the winners). We've since hosted design events, lectures, and more parties, and are planning educational seminars and presentations. The response has been tremendous. However, real-world networking requires real-world space, plus food and drinks, and all this costs real-world money. This is good and bad; money complicates our plans, but gives us an excuse to contact sponsors.

Our tools are pretty simple—computers, of course; desks; office space; and an Internet connection. Throw in common software packages like Eudora, Photoshop, and Dreamweaver (for emailing, image processing, and web production), and you've built yourself a design office. But our real work is communication: between and among us, our users, our clients, our sponsors, and our technicians.

I didn't start a punk band in college because of some burning desire to express my individual artistic vision. Instead, it was a good excuse to get friends together, have fun, and drink for free. By playing from the heart, without a lot of planning or foresight, our band had a great time, and do did our fans. Years later, Core77.com carries on that tradition of doing what we want, when we want, and how we want. Our audience is clearly enjoying themselves, and we are too. And every once in a while, we get free drinks!

I ♠ design

core77.com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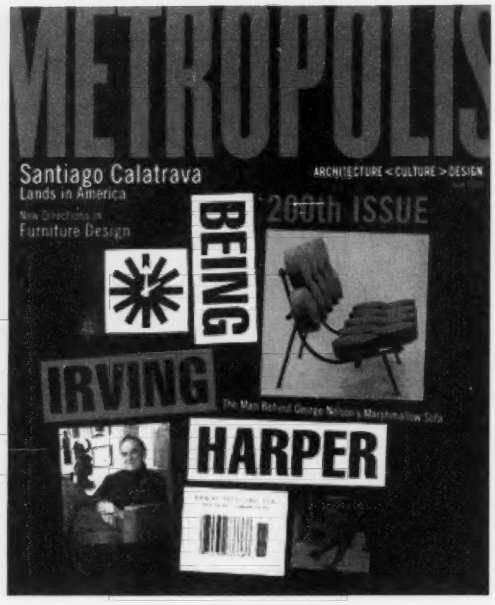

Hands-On

by Susan S. Szenasy

Susan Szenasy is the editor-in-chief of the magazine *Metropolis*. Susan's revered publication is a flagship of the design world, making valiant odysseys into the far reaches of architecture, furniture, and general culture.

For *Whole Earth*, I asked Susan to describe her glamorous, cutting-edge Manhattanite lifestyle in an immediate, tactile, plonkingly practical way. Folks, this is the real-life, genuine look-and-feel of veteran, professional work at the apex of a major design publication. It's an honest report from a woman getting straight to grips with the very stuff of design. —*BS*

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IT'S 10 O'CLOCK ON A RAINY WEDNESDAY NIGHT. I'm sitting, in a rather twisted, ergonomically incorrect position, on my famous ergonomic chair, Herman Miller's award-winning Aeron. It's a chair I love for the way it looks (and also for how it's made, including its various environmentally sensitive features, like some recycled materials); it reminds me of a big, gray grasshopper that's just landed from a 1950s sci-fi film.

I'm typing these words on the black keys of my blueberry iMac. I wanted tangerine, but got what everybody else got when we upgraded our computers at *Metropolis*. My desk top—all three expansive sections of it, white laminate board built around me to form a great, big geometric C—is piled high with papers, books, magazines, press kits, stand-up files crammed with folders spilling over their contents, a Rolodex that looks like an abused head of lettuce, a black phone that I have to dig for, a silver-toned Artemide desk lamp designed by Michele De Lucchi, a purple heart-shaped box of red foil-wrapped heart-shaped chocolates I got from someone for Valentine's Day, another heart-shaped box (this one navy blue with little stars, from another Valentine's Day) filled with paper clips.

There are various glass and metal containers (cups, vases) that arrived as parts of press promotions. They now hold pencils, a ruler, an orange lollypop with Knoll's initial K embossed on it, a white chocolate Santa, a pair of 3-D paper glasses, a small bottle of grappa, an even smaller bottle of Aquavit, samples of photographically printed ceramic tiles, and a small bronze replica of a Russian Constructivist skyscraper that was never built.

As I look up from my computer, on the wall is an image of a grinning, goofy-looking man—the late Tibor Kalman (a fellow Hungarian refugee from the 1956 Revolution). With his irreverent wit and brilliance, he brought new life to graphic design during the 1980s. The wall of shelves behind me contains more printed matter and a host of highly various items. The red cross-shaped medicine cabinet that Tibor sent editors one Christmas. A really bad pencil sketch of Elvis that one of my editors brought back from the South (to go with my collection of portraits of the King). A tiny replica of Verner Panton's 1960s molded plastic chair in orange (I have two chairs of the same design, full scale, in my living room at home, in orange, too). A colorful hand-blown glass goblet designed by Alessandro Mendini.

My office also features two Kartell chairs—Philippe Starck's design in transparent plastic—both groaning under stacks of books and piles of papers. I bought these chairs as a set of four nearly two years ago, with

Susan Szenasy at work in her office. Can you find her?

the intention of taking them home. I managed to transport two of them in a cramped taxi. (In my apartment, the Starck chairs also became bookshelves.)

The stacks of magazines on my charcoal-gray rug will eventually be read, one weekend when I come into the office to do just that. But this weekend I'll be writing a speech about cities and their creative essences, for delivery in Cleveland next weekend.

In the massive pile of mixed information and stuff next to my computer is a smoothly worn, egg-like rock I picked up at an Arizona retreat (which I helped produce). Speakers there, including me, discussed the necessity for each of us to integrate the needs of body, mind, and spirit. The rock reminds me, every day as I touch it, briefly, before I switch on the iMac, how ridiculously out of balance my life is.

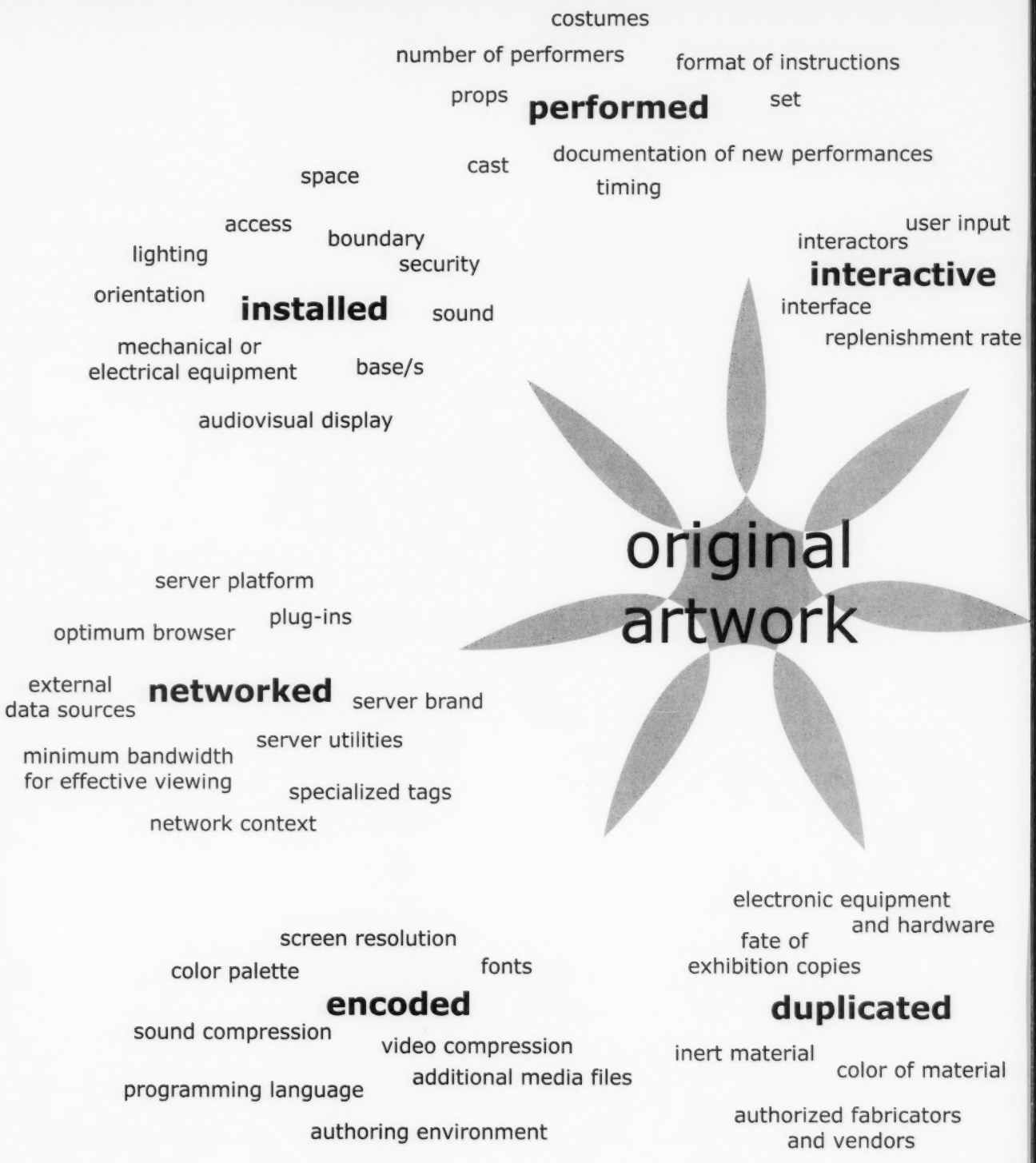
I work all the time; mostly because I love what I do and my job challenges me. But my job is increasingly hard to describe. As the editor of a design magazine that covers everything from urban planning to architecture and interiors to product and graphic design, I'm obliged to stay informed about all those areas, as well as the social, economic, political context in which they operate. That's not a chore, however. I'm an info fan and have always loved reading.

When I started at the magazine, fifteen years ago, I worked with writers, edited, and wrote pieces. I was a real hands-on editor—involved, probably annoyingly so, in everything. Now I advise a very able staff of editors and art directors. I also contribute to such diverse efforts—each with its own, messy pile of paperwork—as updating our website, producing and facilitating our bi-annual conferences, giving speeches and moderating panel discussions, and consulting on the books we began to produce in this, *Metropolis*'s twentieth-anniversary year. (Our first book, which looks at twenty years of design, is being put together now.) And one afternoon every week I run down to the Parsons School of Design to teach courses in design history and ethics.

I live in my head and tend to ignore my body. Sometimes this is a good thing, as it was recently, when I fell and shattered my elbow. An office memo went around saying that "Susan's in the hospital and we don't know when she'll be back." I was at my computer—with three metal pins and a coil inside my arm holding my broken bones together—less than a week after surgery. The work, my interest in it, took my attention away from my disability. But I see the downside of this obsession.

Most days I forget to each lunch. When I realize I'm starving, I wolf down a slice of pizza while devouring the contents of some article, memo, or press release. And on those nights when I'm not eating out, and work till all hours—like tonight—I end up in bed with takeout Chinese food. It's my favorite, but eating at that late hour can't be good for my system.

What should I pick up tonight? Prawns with broccoli or moo shoo chicken?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The Medium Is Not the Message

by Jon Ippolito

Nitrate films left in fifty-year-old canisters are spontaneously combusting. Performance artists from the 1960s and 1970s are stroking out. Video from the 1980s is unreadable. And another web plug-in went out of date while you were reading this.

Not to worry! The variable media paradigm, an unconventional new strategy for presenting and preserving art in new media, proposes that the best way to preserve art in ephemeral formats is to translate it into new mediums once its current medium becomes obsolete. This requires artists to define their work according to behaviors like "performed" or "networked" rather than in medium-dependent terms like "film" or "video." The variable media paradigm also asks artists to choose the most appropriate strategy for dealing with the inevitable slippage that results from translating to new mediums: storage (mothballing a PC), emulation (playing Pong on your laptop), migration (putting Super-8 on DVD), or reinterpretation (*Hamlet* in a chat room).

www.guggenheim.org/variablemedia

John Ippolito is media arts curator at the Guggenheim Museum in New York City.

Being Green in 2001 AD

THE CARBON WARS BEGIN

by Kert Davies

Kert Davies is the director of Greenpeace's global warming campaign in the US. He is a graduate of Hampshire College and holds a Master of Environmental Studies from the University of Montana. He has attended the last three international negotiating sessions of the Kyoto Protocol climate change treaty and will join the Greenpeace team in Bonn this July for the next round.

IT'S TIME TO HIT THE STREETS

We have no choice. There is no refuge for the weak or faint of heart. These are grave times for environmental geopolitics. Every one of us can and must work and fight to push out the offenders and correct the course.

We are in deep trouble if the planet's assembled scientists are even half-right about global warming. All other environmental dilemmas pale by comparison to this one. The ice-caps are going and the coral reefs are crying out. By 2025 or 2050, the ecological din will be deafening. By then it may be too late to avert a climate crash. There's a large likelihood of events breaking out that no scientist could ever predict, of events occurring that are beyond our comprehension.

President Bush copped out on his campaign promise to regulate carbon pollution. This broken promise was a serious political miscalculation that will leave another lasting stain on the Bush family legacy. History will mark his efforts to destroy the global warming treaty, and with it the work of countless individuals, and millions of hours of negotiation, by over 180 nations, for over a dozen years.

The coal and oil henchmen working with Cheney and Bush will also pay a price. As will their cronies in Congress. The Toxic Texan will try to recover by slapping cosmetic Band-Aids on the damage done, but the wound will fester.

There is a bright side. Bush's retrograde actions have sparked the global debate we have long needed. George W. Bush has singlehandedly educated the world on this issue. His arrogance did more good than Al Gore's *Earth in the Balance*. He raised consciousness faster than scores of paid enviros have managed in years. Front-page stories around the world have now focused the ire of the planet on the hapless USA.

The *London Independent*'s front page recently screamed: "George W. Bush: Polluter of the Free World!" Ordinary people who imagined that the planet's interests, and their own, were safeguarded under the Clinton-Gore administration are coming out of the woodwork.

Here's a sign of the depth of the dust Bush has kicked up. In a recent *Time* magazine dedicated to global warming, the editors published an open letter to Bush expressing the urgency of the climate issue. Among the signers were Jimmy Carter, Mikhail Gorbachev, John Glenn, Walter Cronkite, George Soros, Jane Goodall, Edward O. Wilson, Stephen Hawking, and J. Craig Venter. Not a bad crew to have on our side.

EVERY DROP COUNTS

The technology exists to squeeze every drop of oil and gas out of the Earth. Americans can chop the tops off of every coal mountain nationwide. The hardware is not the limit here, but there are limits. Carbon dioxide is about 30 percent above historically measured "normal" levels already, and global warming is already kicking in. On our present energy path, carbon dioxide in the atmosphere will easily double its natural levels in coming decades, and it might triple or quadruple them. This prospect is completely unprecedented. It sends computer forecasts of the planet's climate spinning out of control.

If carbon dioxide is "not a pollutant," as the Bush Administration now claims, then that term has no meaning. Carbon dioxide is no longer a "natural" substance when it is being pumped into the sky at millions of tons per day. Salt is natural too, but throw a little bit into your goldfish bowl and watch Swimmy go belly up.

Bush blandly denies the scientific evidence of human-induced global warming, but what are the rest of us to do about that constant barrage of weird weather, with bizarre and dangerous storms, altered seasons, shifting ice pack, and rising seas? Scientists worldwide are being very frank about these ongoing changes: they know this is just the beginning. We'll see far greater disruption of our climate as global warming progresses. We'll suffer from spreading disease and pests, from increased intensity of hurricanes and El Niño, and from damage to ecosystems in every corner of the world. Where are the people supposed to hide from that reality? Inside the West Wing? In ExxonMobil's Houston headquarters?

THE AMERICAN WAY

Dick Cheney's carbon-energy goon squad wants to drill in every corner of the nation. They'll build thousands of sooty power plants and breathe foul life into the dying nuclear power industry. There is nothing new or clean about oil, coal, and nukes.

The tactics here are transparent. First, Energy Secretary Abraham launched his spin job to panic the populace with a looming and fraudulent energy crisis. Next we'll see a summer of brownouts and inflated Republican rhetoric, amid simmering Greenhouse heat waves. Then Dick Cheney, emergency energy plans in tow, will hurl himself into the masses of anti-nuclear protesters.

The ludicrous Bush-Cheney campaign to drill and despoil the Arctic has met with strong opposition in the Senate. This smash-and-grab raid to inflate Big Oil's already historic profits has inspired public contempt. Bush will change tactics and spin his necessary capitulation as a concession to the greens. He'll then require "concessions" from the other side. But we know better.

What would a sane American energy policy entail? Simple—it would mean a genuine plan to rapidly implement existing clean renewable energy technologies: wind, solar, geothermal. America must kick its debilitating, dirty, and financially ruinous addiction to fossil fuels. We must create true energy security. Nothing short of this will do. We can do it, we must do it. The nation and the planet will prosper for it.

Unfortunately, Bush and his carbon cronies are marching headlong for the smokestacks of the nineteenth century. It costs too much to live in the past. With 5 percent of global population and 3 percent of global oil reserves, Americans create 25 percent of the global warming. We Americans burned our oil, it's history now, it's in our air. We can't gain independence chasing oil.

NAMING NAMES

For the record, let's name names. Who are the engineers and conductors on the global warming death train? There has been a deafening silence from the business community. Greenpeace recently sent personal letters to the CEOs of the top 100 US companies asking them to state their minds on the Kyoto process. We'll see what the private sector has to say about roasting their own shareholders and consumers.

Globally, greens from other nations are looking to vent their displeasure with American policies by boycotting US oil companies. These folks have an objective view on America that we sometimes lack. They didn't pick that set of targets for nothing.

It's a national embarrassment to have an Administration so blatantly for sale, but let's talk politics anyway. Dick Cheney must be singled out as a particular bad seed. It must annoy him that a life in public service required him to sell off his massive interests in the oil company Halliburton. This gross lack of foresight is typical of him, and it required him to pay $14.3 million in income taxes this year.

Gale Norton is covering for Bush at the Department of the Interior. Norton will bear the most direct responsibility for opening the Arctic Wildlife Refuge and the wildlands of the West to those whirring drills.

Christie Whitman, a one-time Republican power broker, has become an object of pity and scorn at the EPA. She shrinks every time we see her, since Bush cut her off at the knees by unilaterally withdrawing from the Kyoto Protocol.

How can good-soldier Colin Powell, now Secretary of State, expect any nation in the world to trust his diplomacy when the Bush Administration blatantly tramples solemn international treaties?

Paul O'Neill at Treasury is a former aluminum executive; he had a more nuanced approach to the climate-busting antics of Big Oil. He hasn't been heard from lately.

National Security Advisor Condi Rice had a supertanker named after her for her stint on the board of Chevron. She was the public undertaker for the Kyoto Protocol.

The Senate swarms with nasty environmental reactionaries. Alaska's Senator Murkowski is anxious to loot his own state. Larry Craig of Idaho, Chuck Hagel of Nebraska, Pat Roberts of Kansas, and the infamous Jesse Helms of North Carolina penned the letter to Bush warning of Kyoto mayhem from Republicans in the US Senate. Bush replied on cue with the death penalty for the treaty.

The planet's majority is rallying to move forward without the US at this summer's extension of the Kyoto negotiations. Let's hope the parties are ready to send the Bush team packing if they don't cooperate.

SO JOIN THE FRAY:

Hit www.greenpeaceusa.org to take cyber action, sign up for actions, or join Greenpeace's volunteer corps.

Hit the streets at public political and corporate events, and challenge leaders to tackle global warming aggressively.

Show up at your elected officials' offices and ask them what they are doing to solve global warming.

Write letters—this really works politically, perhaps because it is so old-fashioned.

Students can get into Cool the Planet, www.cooltheplanet.org, our student network of global warming activists.

The heat is on. When New York City has summers like Bangkok once did, and Bangkok has summers like nobody's business, there will be no doubters and dilettantes left. When a Category 5 hurricane like Mitch rolls over Jeb Bush's Florida, we'll know where to look for an explanation. When the winters get so short that mosquitoes fly year-round, when the sugar maples of New England have been banished to Canada, and when every coral reef is bleached dead white by hot water, we will know whom to blame. We'll remember Bush and Cheney as the architects of a holocaust.

We'll also remember the corporations who stood silent as they spewed their pollution into the skies, as the all-too-willing executioners of their own clients, customers, and stockholders. Our children will learn that we had a solution in our grasp, but gave it up to make the carbon cartel richer.

Bottom line, we've got to pry this puppet out of the White House. Pay attention now, for the carbon wars are turning ugly this summer, and those wars will get much, much uglier. It's now or never, really. Forward march.

FOOT-AND-MOUTH... OR FOOT IN MOUTH?

BY CAROLINE OAKLEY

Caroline Oakley is managing editor at Europe's leading eco-centre, The Centre for Alternative Technology in Machynlleth, Wales (www.cat.org.uk). She spent twenty years in central London working in general trade publishing before moving to the Welsh mountains in May, 1999.

Welcome to the UK, in the spring of 2001. If all you've seen of us is the TV news, then you might be wondering whether we're still here. No, the British countryside isn't ablaze with fiery pyres; we're not all donning white boiler suits and gas masks. The country isn't under martial law (despite the fact that it must feel like that if you live in Cumbria or Devon).

Caroline dipping her feet in disinfectant to ward off contagion.

Here in Wales, where I'm writing, spring has finally begun to break, at the end of the wettest winter in a century. We are beset by a series of modern-day plagues. There's an underlying feeling of tension nibbling at our self-satisfied, First-World-cozy lives. However, the lights still come on, which is more than can be said for California.

What's really beginning to creak here in Britain is our infrastructure. First there's financial insecurity, due to the foot-and-mouth virus and its damage to agriculture and tourism. Then there's our rail network. The trains are bedeviled by lack of appropriate funding, corporate mismanagement, and distance from real user needs. We're no longer sure about our traditional national industries. When is a British car a "British car"? When it's bought here? When it's built here? Or when the manufacturer's board of directors lives here?

Then there's the way we Britons feed ourselves. Suddenly we find ourselves dealing with the long-term consequences of our desire for more and cheaper food. There's the BSE scandal—Bovine Spongiform Encephalopathy, a truly insidious illness. There's foot and mouth virus. There's big, bad weather devastating the farms.

The effects of overcomplexity are eating into our national psyche. We've been nannied for so long that we've forgotten how to do anything for ourselves. It's hard to get from A to B without relying on someone else to pay for it. In a system this elaborate and off-balance, no one wants to take responsibility anymore—literally or metaphorically.

This nexus of problems has suddenly come into focus for me. Maybe it's because I've dropped out, or downshifted (as some would say). I moved from mainstream publishing in central London to publishing for The Centre for Alternative Technology in rural Wales. I see the world through a wider-angle lens now. I'm no longer zooming in on the centres of two or three international cities. I'm looking laterally. The knowledge learned here at CAT over twenty-five years can be applied to the big wide world, far beyond our own confines in an ecologically regenerated slate quarry.

All of this new green stuff I was learning in Wales seemed fine and dandy—until the beginning of summer last year. Before last summer, hopping back to London was simple: I could drive there or take a train. Suddenly neither choice worked any more. I could get on a train and just sit it out until I got to my destination, which could take four hours, or nine, or nineteen. There was no guarantee that my rail connections would actually connect. Or I could drive, along with the thousands of others who had abandoned the public transport system for the motorways. That meant that I might sit for nine-and-a-half hours, travelling at an average speed of 30 miles per hour. I once found myself stuck behind a Danish bacon lorry for hours, without food, while one of my famished passengers hallucinated pork pies and bacon sandwiches.

Oh, and I forgot to mention that car travel was also dependent on being able to get petrol. For most of one month, fuel too was no certainty. Battles between the OPEC nations, the tax man, and the man on the street meant that our oil refineries were barricaded in. There was rationing at the petrol pumps.

One broken rail means dead passengers. The rail system is in chaos, and the latest estimate for complete rehabilitation of the railways is still months away.

Oh, and don't forget the weather. Flooding makes motorways impassable. Thanks to a record eighty-three days of rain over September, October, and November of 2000, there were several days when I simply couldn't get beyond a mile or two from my front door.

From now on, doing something about global warming won't mean putting a few coins in a collecting tin for Mozambicans giving birth in trees as the floods climb beneath their feet. Maybe now I'll actually get round to changing to a company that supplies renewably generated electricity. Somehow this seems more urgent when I can't get to the shops to buy food to eat. Climate change is here, it's now and it's happening. Not just in Britain, but where you live too.

Since last summer, things have gone from bad to worse. I can't even trust the food on my plate. BSE was bad enough. I've almost managed to stop worrying about the number of burgers I ate when I was at college twenty years ago; no more fretting that my brain is gently turning into Gorgonzola. What's done is done. But I'm sure as hell not going to let something like that happen again. Whoever thought it was a good idea to let herbivores dine on mechanically recovered meat? "Mechanically recovered meat"? What is that supposed to mean to us?

I'm no Luddite. I edited science fiction novels for ten years, and have loved them for a lifetime. But some things just don't add up. The phenomenon behind both BSE and those satanic pyres on TV is the industrialization of agriculture. We are losing tens of billions of pounds in trade from tourism alone. No one has stopped to count the indirect losses elsewhere. All this to save an offshore market in exported British meat that is worth only three billion pounds. We're already importing more meat than we export, so why can't we just eat our own meat? Let's import less, and forget about shipping our stressed-out sheep across the English Channel. Am I missing something here? You tell me.

It's not just the sheep that aren't welcome abroad. My sister caught a plane from the southeast of England to Glasgow in Scotland. She was disinfected on arrival. She'd come from a British city with no cases of foot-and-mouth to another British city, well north of most reported Scottish cases. Still, she wasn't considered "safe."

This paranoia isn't confined to the UK. Two friends of mine had flights booked to stay with friends in Bavaria, the week before Easter. But word got out in the German village that visitors from Wales were due. The atmosphere turned decidedly frosty. The would-be hosts were taken to task and warned that, should they have the temerity to allow their intended British guests to stay, their children would be banned from school for fear of spreading contagion to their farming neighbours.

Apparently, there are international tour operators phoning the UK asking whether or not there's enough food to eat. It just goes to show that there's nothing like a globalized media for sensationalism. In reality, there's no long-term harm done to the animals who get foot and mouth virus. They get ill, and they get better. The disease isn't transferable to humans. The animals are still edible after they've recovered. Or so we're told by our authorities, but it's hard to retain your sense of perspective after years of misinformation. We're just making sure we can sell our produce to countries that could grow their own if they reorganized a bit.

It's not just the sheep that aren't welcome abroad.

These are not theoretical worries any more: they are personal. I might not have a job if this media-slash-political-slash-business circus runs for much longer. Visitor numbers at the Centre for Alternative Technology are down. The tourists stay at home for fear that the countryside is closed. If they don't come to Wales, they don't come to CAT. If they don't come to CAT, they don't buy our books, and if they don't buy our books, I don't have a job. That does keep me awake at night.

Okay, so we're not at war in Britain—not like they are in Israel or Macedonia—but the town versus countryside debate gets a lot of press over here at the moment. What is the countryside for? For growing food to feed the nation? Or is it time we British concentrated on what we do well? Theme-park Great Britain? Cumbria for the Lakes and Wordsworth's daffodils, Cornwall for Poldark's cliffs and coastline, Scotland for golf courses and Macbeth's castle, the Midlands for Shakespeare....History and landscape, that's what we're good at.

Only time will tell, but for my money, it's got to be a bit of both. Without the means to feed ourselves locally, we're not going to be sustainable in the long term. If we keep buying from the cheapest sources, we're going to run out of resources sooner rather than later—both at home and abroad. Cheaper and easier is neither, not in the long run. And we live in a whole Earth, not in a vacuum.

OK, so this is a small snapshot from a small country, but the patterns are the same pretty much world over. Let's hope I'm not the only one who's beginning to see the bigger picture.

If you'd like to see a bit more of that picture, visit our website at www.cat.org.uk—take a look at what we're doing, at the books I publish. It might help us all to stick around longer.

Being Green in 2001

BY JON LEBKOWSKY

Jon Lebkowsky has served as a community host/moderator for the WELL, Electric Minds, and HotWired, and has written technoculture articles and rants for *Wired*, *Whole Earth*, *The Austin Chronicle*, *21C*, *Factsheet Five*, *Mondo 2000*, *Mindjack*, and other publications. He was the "Consciousness" subdomain editor of the *Millennium Whole Earth Catalog*.

History

In the sixties and early seventies, my own g-g-generation discovered "the environment." We added it to our charm bracelet of concerns, which included world hunger, the Vietnam War, gender and racial inequality, haircuts, junk food, television, processed food, nuclear energy, Republicans and Democrats. We had definite intentions to do something dramatic about all this stuff, but most of us were distracted along the way by kids, car payments, mortgages, alcohol and narcotics, Alcoholics Anonymous and Narcotics Anonymous, trips to the mall and our fitness programs. We became young urban professionals defined by consumption patterns and significant debt loads.

So we forgot those grand-scale crises, though we kept recycling; signed petitions to save greenbelts, humpback whales, and Black-capped Vireos; bought Sierra Club calendars; and drove the smaller, more energy-efficient SUVs and pickup trucks. We enjoyed the great outdoors, wore rugged clothes, and separated newspapers and bottles from the rest of our trash. We did a rather conspicuous bit to control population (saving many child-care bucks along the way). We took our 2.1 kids to Earth Day celebrations.

But we were also human, fallible, forgetful, cheerfully greedy. We heard that there was a hole in the ozone, but we stopped using chlorofluorocarbons, so that became okay. To do our part, we were thumb-pumping our spray. We didn't think to knuckle down and really check whether that ozone had actually healed. What does an ozone layer do, anyway? Our kids probably knew that.

Our jobs and our lives kept us busy. Time passed.

Scientists were still paying attention. They had been measuring atmospheric CO_2 at Hawaii's Mauna Loa observatory, and by 1983 they were seriously worried about Greenhouse gases in the atmosphere. These gases are the stuff of life; they are essential to the biosphere because they trap and hold heat from the sun's radiation. However, massively increased volumes of them were causing a warming trend over the Earth's surface.

Soon, the Environmental Protection Agency was soberly reporting, in stiff bureaucratese, that "agricultural conditions will be significantly altered, environmental and economic systems potentially disrupted, and political institutions stressed."

In 1988 the United Nations established the Intergovernmental Panel on Climate Change (IPCC), comprising the world's leading climate scientists. They organized the Rio Earth Summit of 1992, which acknowledged a pressing need to cut Greenhouse gas emissions—specifically, human gas emissions, primarily from our factory emissions and our car exhausts. In 1997, the Kyoto Protocol was established. Its purpose was to get industrialized nations to commit to curb their spew.

1998 was the hottest year on record, and a megastrength El Niño caused massive storms in some areas, severe drought in others. So much for hand-waving theory and early precursors. Now it was real.

Warming

I live in Boulder, Colorado, where climate and environmental studies are on the city's doorstep. The National Center for Atmospheric Research and the National Oceanic and Atmospheric Administration both have big facilities in Boulder, and the University of Colorado has one of the best environmental studies programs in the US.

I dropped in on Dr. James White, director of the environmental studies program. He said that the global climate is definitely changing, and there's no doubt that human activity is a significant driver. "If you look at the simple physics around how Greenhouse gases work, if you look at the fact that Greenhouse gases are on the increase, we know we're having an impact on climate," he says. Now the debate is about how that impact is expressed. It might be generalized heat. It might be megastorms. It might be overall climatic instability of some kind we've never seen before.

Can't we have more certainty out of our weather science? Not according to Dr. White. "My own research tells me that climate change is not this give-and-take, push-and-shove kind of linear system, where if we increase CO_2 by X, we get X climate change; if we increase it by 2X, we get 2X climate change. That is really what the models give us as feedback, because the models don't have mode changes. If North Atlantic deep water fails, a sophisticated model can handle that. But if you look at the way climate has changed historically, going back over the history of the Earth, it's not a little bit here, a little bit there.

"It's more like my little brother, when we were kids. I would pester him, and he didn't respond, and I would pester him more, and he would blow up, and yell and scream at me. When Mom asked me what I did, I said 'All I did was poke him once, Mom.' But there was all that energy I built up in my little brother with all those other tor-

www.ncar.ucar.edu/ncar/
The National Center for Atmospheric Research, NCAR, was established in 1960 to serve as a focus for research on atmospheric and related science problems.

www.noaa.gov/
The National Oceanic and Atmospheric Administration was created in 1970 to conduct and apply research about the global oceans, atmosphere, space, and sun, protect life and property from disasters, and promote intelligent use of resources.

www.colorado.edu/envirostudies/
The program is designed to provide a broad but rigorous education in environmental issues and problem solving, as opposed to traditional discipline-based training.

menting little pokes. And it's that kind of nonlinear behavior that makes waiting for the shoe to drop a rather dangerous activity."

Despite the current global warming trend, the southeast US has been actually cooling lately. Temperature trends throughout the US are relatively flat compared to the rest of the world. Though we know climate is changing, we don't know the long-term implications. Lacking clarity about direct, polarizing impacts right in someone's back yard, it's simplest to do nothing.

Scientists are taught to think in terms of hypotheses and conditional statements, not blatant warnings of doom. As a culture we're into denial, especially about problems that seem distant, but demand big money right now. George W. Bush disses the Kyoto accords as too expensive to implement. For him, they are, because short-term political costs to George Bush outweigh long-term climate damage in someone else's administration. Says Jim White, "I think the sad reality is that we may, before all is said and done, get a big climate change, and that may be the mobilizing factor. Some people have argued that we'll need that. We'll need the big change, the grizzly bear set free in the house, before we deal with the bears in the yard."

Green Teams

White's been looking forward. "I see carbon dioxide and climate change as merely step one in many steps, many problems that are going to happen in the future," he says. "We're going to have to have global cooperation to deal with them all. So we need to take the first step with something like the Kyoto treaty. Maybe we're not going to get the best treaty we possibly can, maybe it's going to have a little more economic impact than we could potentially negotiate. But let's take the step. We're going to have to get to some point of global cooperation in the future, and we're certainly not going to get there if we take all of our toys and step back from the table, and say no, we're not going along."

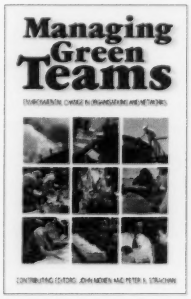
Meanwhile, White and his colleagues in Boulder are working on a solution in a new, cross-disciplinary approach to environmental sciences curriculum. The University of Colorado has a National Science Foundation grant for a curriculum called Carbon, Climate, and Society. "The idea is for graduate students from the natural sciences—biology, geological sciences, chemistry, etc.—to be coeducated with students from economics, political science, and in particular, journalism. At an early stage in a graduate career, they'll learn team-building skills, essential for them to address environmental issues. There's just no way that a person going through any one discipline can really grasp the full breadth of environmental problems, because it involves the full complexity of humans interacting with the natural environment. So the idea is that they will learn first how to trust their colleagues in these various fields. And we want them to learn how to communicate with the media, and through the media, with the public."

This seems to me to be the kind of activism we need in the year 2001. Given that boiling mix of carbon, climate, and society, it's no longer enough to be educated, even in one of the relevant scientific disciplines. We also have to develop and leverage synergy with experts in science, media, commerce, and politics. We need green networks, green teams, where cooperation isn't limited to academia, or to training students, or to networks of journalists, or to policy analysts. It has to be huge in scope; it has to happen all at once.

Corporations can have "green teams." The British book *Managing Green Teams* describes "how environmental teams can trigger changes in core operations and integrate environmental concerns in business decision-making at every level in the organization." A web search on the phrase "green teams" via Google got over 1,400 hits. This is an idea whose time has come.

There are two major differences between the world of 2001 and Earth Day 1970. The first is that it's much hotter; we're not just musing over scare talk about "The Ecology," we're really starting to boil. And the second big difference is digital networks. Networks of this kind are something we did not imagine, had never seen before. This is the one new cultural factor in sight that is of the same vast scope as the problem. We've got to unite via networks somehow, leverage the potential there, and find and invent real answers. Reforming our cars, greening our energy, planting some trees, redesigning our cities, these are virtuous but piecemeal efforts. If there are going to be, within our children's lifetimes, 11 billion people in a sustainable situation, that can only be a vastly sophisticated, global, cybergreen society.

And what do we do about George W. Bush? Pretty obvious. Write his mom a nice, long letter.



Managing Green Teams
Environmental Change in Organisations and Networks
John Moxe and Peter A. Strachan, eds.
1998; 268 pp.
£35
The Robert Gordon University

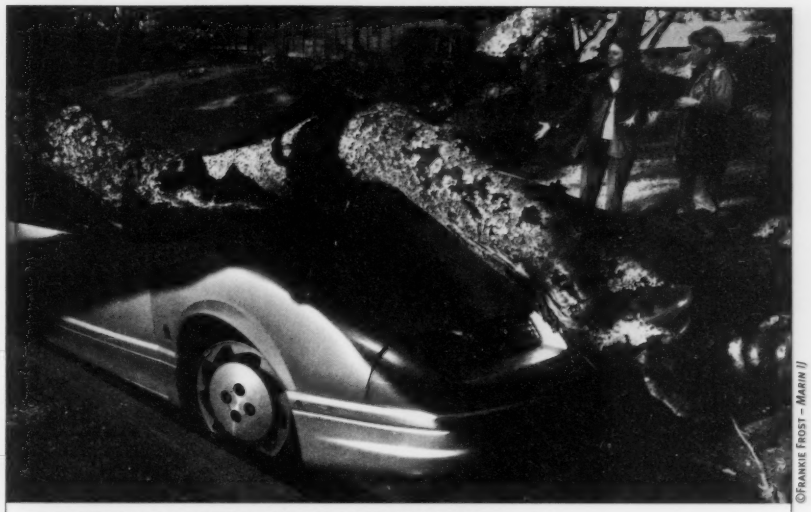
GOSSIP

While Bruce frantically produced this issue, I went off to Herefordshire, England with Rocky Mountain Institute's (Amory Lovins's) team to help Bulwer's (the world's largest producer of hard cider) prosper and simultaneously move toward sustainable agriculture.

The Brits having killed off their island's wolves, the food web seeks its revenge through the microcosmos. Mad cow and foot-and-mouth microbes are the daily fodder of gossip and mortuaries. The hundreth BSE victim died during my stay. Black smoke of burning cattle rises in columns from the pastoral romance of perfect countrysides. I couldn't walk any of the famous paths and Roman roads in the Cotswolds or Wales; trekking is shut down for fear of spreading disease. I stopped at an exquisite all-rock Norman church on the Wales border and talked to a local woman as she licked her fingers clean of a chocolate-and-marshmallow "sticky" and explained how down the road one farmer had his sheep trapped in a muddy field, and couldn't move them because of foot-and-mouth. They bleated and suffered, the government papers to move them didn't arrive, and he couldn't take it and hanged himself. Grim tales, the Dickensian dark belly of verdant green fields, the backside of ley hedges enclosing pointillest apple trees blossoming pink and shocking hardhat-yellow fields of oil rape seed.

Bulmer's secures the cash flow to orchardists with thirty-year guaranteed contracts for cider apples. It helps maintain the most rural county of England. We looked to see if a business case could be made for sugar beets, corn, or barley to replace imported "industrial" glucose; if the Bulmer mills could also produce organic fruit juices (especially from dessert instead of cider apples); if polycultures could remove the need for pesticides and agro-chem fertilizers; if tree prunings could be ground up and made into a medium for shiitake mushrooms; if a by-product of rape seed oil could become a biodiesel. Amory worked his magic on the factory itself by showing how reducing friction in wrongly sized pipes could save thousands of dollars worth of pumping costs and how energy efficiencies would accelerate profits. And the sun shown for three straight days, which was a rarity marveled at in pubs and by kayakers on the river Wye. It helped us parachuted-in consultants become believable.

Twenty miles away, in a town of 1,500 with thirty-two bookstores, the Whole Earth dialogs on chain bookstores, amazon.com, and independents seemed unreal. The Hay-on-Wye book festival featured stars and budding writers of the UK, most completely unknown to me or my American friends. Only Harry Potter seemed to bridge the Atlantic. And there was Bill Clinton talking about conflict resolution to standing applause, shaking hands as if all were well, and demonstrating convincingly that he does love hard-copy reading. The Internet was like a far ghostly creature from across the moors.



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PROVIDENCE SPARES *WHOLE EARTH* STAFF

Whoever is running the universe must want to see *WE* continue. In April, a huge, invisibly fungal-rotted oak tree split and crashed onto the driveway of the Falkirk Center, home to our offices. Half the tree obliterated the Saturn sedan of Dana Melnichek, a Falkirk cultural assistant, who was literally seconds away from climbing in. (That's Dana, on the left above, surveying the damage with her friend Joan Peck.) The other half of the tree landed in the stretch where Emily (with passenger Devon) and I had both been parked a few minutes before. Peter, who usually also parks in that driveway, was away giving a speech. Had the oak split at a slightly different moment the entire staff might now be fond (we like to think they'd be fond) memories. We're waiting for further word from the universe. —*MKS*

Whole Earth News

A beautiful memorial for Donella Meadows took place on Earth Day weekend at the San Francisco Palace of Fine Arts. *Whole Earth* contributors Vicki Robin, Hunter Lovins, Paul Hawken, and Randy Hayes gave witness. This was the message Donella wrote to herself, pinned above her computer:

My writing is a search for truth.
It comes out of love.
It empowers;
It does not judge or accuse or rob anyone of dignity or respect.

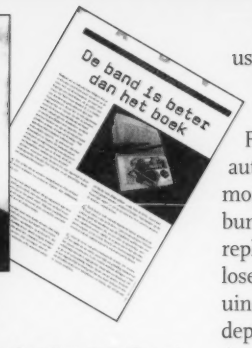
It is clear and precise.

The passage of my words through the minds of others leaves them more open, more thoughtful, compassionate, committed to Quality.

Every one of my readers is the Key to the Workability of the Planet.

I give in my writing of myself and my struggles unstintingly;
It is all I have to give;
The "I" of it is unimportant,
It is the universal humanness that is important.

Two *Whole Earth* pieces were excerpted in the May-June, 2001 *Ode*, from Rotterdam (www.ode.nl): Kevin Kelly's essay on books on tape (*WE* , Winter 2000) and Susan Griffin's "To Love the Marigold" (*WER*, Spring 1996).



Jeanne Carstensen, former managing editor of the *Essential Whole Earth Catalog* and guest editor of the Winter 1987 *WER* (which became *Signal*) and of our Spring 2000 special in on grassroots radio, has been awarded a National Arts Journalism Program fellowship at Columbia—a big apple she well deserved after living the life of a penny-paid, alternative journalist. Before they made their ways to *Whole Earth*, Mike was Jeanne's teacher at World College West.

• • •

In mid-May, Monika Olson, our sometime design editor, popped a girl, Kamala Rose. We wish her good luck. —*PW*

Creating Our Future

Memorial Day weekend, the wheat-colored, mist-coated foothills of Walker Creek Ranch in West Marin became the site of a "historical moment" (unprecedented in activist history, according to long-time activist John Steiner), when young and old visionaries came together to share their ideas and memories and to talk deeply about ways to combine spirituality with social conscience. Inspired by our issue on the spiritual labor of Earth healing (Winter, 1997), I packed my backpack and sleeping bag, caught a ride with a colonoptic therapist/trapeze artist, and headed for the ranch. There my life-long environmental heroes were gathered at Sat Santokh's three-day "Creating Our Future" powwow, featuring legendary panelists Ram Dass, Julia Butterfly Hill, Mark Dubois, Randy Hayes, and Claire Greensfelder, among others. When the eclectic mix of activists, ecologists, students, teachers, scientists, and writers were not listening to radical stories of near-death experiences while trying to save rivers and trees, we were sweating in small discussions (about green politics, youth and education, economics and finance, networking, and sustainability), chanting, hiking in the hills, and dancing in drum circles that lasted until sunrise. It felt like a big sleepover with a hundred kindred souls, aged nine to ninety, sharing wisdom, history, passion, and visions. For more about Creating our Future, see www.satsantokh.com. —*EP*

LETTERS

Whole Earth **is a conversation. Compliments, cavils, and corrections are welcome. Letters and email may be (reluctantly) edited for space or clarity.**

Get Funny

Another funny website ("Ha Ha Web Sites," *Whole Earth*, Spring 2001): www.ironictimes.com

Paul Krassner
by email

Hyperreal or Hype

Dear Peter,

First, I would like to commend you on your extensive and enlightening coverage (Spring 2001 features on restoration) of ways to act responsibly in an era of apathy and irresponsibility. I am in the earliest beginnings of restoring my local riparian zone to what it once was before overgrazing eliminated its lushness and diversity. Many of the articles and recommended books will be referred to in the years to come. Playing God is painful and no easy task, so I need all the support and suggestions I can get. *Gracias*!!

Second, I must say I was deeply disturbed by your article entitled "Wilderness and the Hyperreal." I wonder how much time has gone into saving [the Old Man of the Mountain's] ancient face from the inevitable. I suspect not as much as it takes to preserve or mask the human body from growing old and eventually decaying itself, but a waste of energy and resources just the same. Instead of spraying bleach on blemishes we opt for rouge and powder; rather than fill unsightly skin cracks with epoxy and wire we prefer the surgeon's scalpel to beautify, and even in the end we choose lead-lined coffins with longevity similar to that of this mountain's fiberglass face. I could see how the unaware might be fooled into thinking this particular essay falls under the heading of restoration, but then there is nothing restorative about using chemicals on living organisms, in order to be hyperreal.

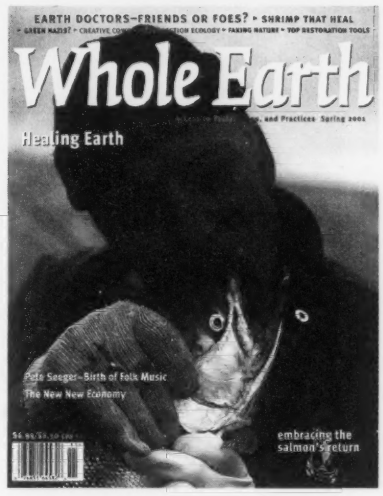
Specifically, in the article the French philosopher's association of authentic nature with the hyperreal is more like a hyperbole—in other words a bunch of bullshit. For by exaggerating or replicating the real with the artificial, we lose touch with reality and the only genuine foundation that we are forever dependent upon...Earth...regardless of the genuine feelings the contrived may engender.

Although I have never been to this particular mountain, I have no doubt that it is special, for all of Earth is. Thus, this place was sacred before there was a desire for restoring and securing. It actually could have become revered even more, if it was left untouched, for by seeing the decaying profile as a reflection of ourselves—finite in form, yet forever changing in content—we may have grasped more deeply the cycles of creation and destruction, and more importantly have been reminded of our own mortality in order to live...more fully now.

This once-great omen of the Abenaki is fast becoming a bad one, by demonstrating what we as a society ignorantly preserve and worship. It is not the Old Man of the Mountain anymore, but instead a mountain made by man. We already have Mount Rushmore and soon Crazy Horse (even more of a hypocrisy), not to mention the many bouncing silicone structures of melon-shaped mountains that are lusted after by women and men alike. Are there not enough altars of the profane already? Indeed we must worship, but please let us pay homage to life and death through all its imperfections and ghastly blemishes, rather than kneeling beneath the ghostly hyperreal—a truly disingenuous and ultimately intangible silhouette of man's perfection.

Hopefully the Nielsen family and the others who volunteer their time to this project read the Spring 2001 issue from cover to cover, so they can see not only what real and meaningful restoration is all about, but also so they can save face through ceasing their defacement upon death and rebirth's continuity.

Sincerest Regards,
Samson Hill
by email


EARTH DOCTORS–FRIENDS OR FOES? • SHRIMP THAT HEAL
Whole Earth
Healing Earth
Pete Seeger–Birth of Folk Music
The New New Economy
embracing the salmon's return

Something Fishy

Editor,

The cover photo of the Spring '01 issue is identified as an Alaska fisher kissing the first salmon caught, before releasing it. This is a moving but dubious image. Giving a healthy fish back to the sea is an important and worthy practice, but this thirty-year veteran fisher must blow the "Honest Abe" whistle here, because the salmon in the photo is dead, or at least irretrievably doomed.

The red on the man's gloves and on the fish's mouth and gills isn't cranberry juice. It's blood from the fatal tearing of a gill net, which has left telltale imprints on the gill covers. The monofilament gill net is an unforgiving device, designed to snag and tear the gills. Fish with torn gills die as inevitably as you would if your lungs were shredded. Zuckerman's article rightfully deplores gillnetting as "destructive and wasteful," implying it is no longer practiced. On the contrary, if every gillnetter in Alaska sent their first fish south, you could feed half the Mattole Valley.

Thankfully, salmon caught in Oregon and California are trolled up from the ocean on barbless hooks attached to lures (I use sixteen total) that entice fish to bite. Each fish is individually handled and inspected. Coho and undersized chinook are released with very low mortality.

Here in Oregon we're experiencing a record-book season again, so it seems that restoring spawning grounds is having a positive effect, and a live troll-caught salmon released—with or without a kiss—has a better chance of fulfilling its life cycle.

Sincerely,
Lee Taylor
Seal Rock, OR

Natalie Fobes, who shot the cover photo, responds:

I can assure you that the sockeye salmon Pete kissed was very much alive when I took the photograph. Due to the good fishing that day, the salmon had spent, at the most, a few minutes in the net. And the fish was out of the water for such a short time that I was able to take only one unposed photograph before Pete put the salmon back into the bay. I watched as it was carefully placed back in the water, and saw it swim vigorously away. I have also spent literally weeks underwater photographing salmon in the streams that empty into Bristol Bay. I have seen plenty of healthy, spawning salmon bearing the marks of gillnets.

I have written about and photographed salmon and her cultures since 1983 (and was a finalist for a Pulitzer Prize for a newspaper section, "The Saga of Salmon"). My book *Reaching Home: Pacific Salmon, Pacific People* (with essays by Tom Jay and Brad Matsen) is in its second printing. I have worked on both gill-netters and trollers, and I know that the disagreements and misunderstandings between their adherents are deep and long-standing. Each method has advantages in some circumstances, and neither is without problems. Lee Taylor's letter raises legitimate concerns, but it oversimplifies a very complex situation.

The letter states that Seth Zuckerman's article "rightfully deplores gillnetting as 'destructive and wasteful.'" In fact, the Zuckerman article specifically refers to high seas *driftnetting*, something very different from the gillnetting practiced in Bristol Bay. High seas driftnetting employs miles-long nets that are placed in the water and often left untended for hours. It *is* highly wasteful, and is now banned by international treaties. The Bristol Bay fishers' nets are yards long, attached to the fishers' boats, and tended constantly. Fish are often pulled onto boats within minutes of being caught. Different mesh sizes for different situations increase the likelihood that immature fish will pass through without being caught.

Bristol Bay is home to the largest run of wild salmon in the world. Between 44 and 66 million fish return to the Bay within a two-month period. Most of those return within a three-week period.

Bristol Bay is also home to the largest commercial salmon fishery in the world. How is this possible? Two reasons: The freshwater habitat needed by salmon is in pretty good shape. And the commercial fishery is heavily regulated by state biologists who determine when and where the fish can be taken. Regulators prohibit fishing unless and until sufficient numbers of fish of every age are recorded reentering their home streams and rivers at all stages—beginning, middle, and end—of the run.

Because the gill-netters work the mouths of tributaries, fishers and authorities know the origins of the fish caught. By contrast, trollers in the open ocean cannot tell whether the fish they catch are from a healthy run or an endangered run of salmon. In some places (such as waters off US, Canadian, and First Nations' territories) disputes arise from not being able to tell even the countries of origin of fish caught by open-ocean trollers. Trolling has its own mortality rates as well; I have seen damaged fish fall off trolling lines before they could be brought onboard.

I could say more, but I hope that I have at least suggested that the situation is much more complicated than Lee Taylor's letter implies.

Sincerely,
Natalie Fobes
Seattle, WA

Restoration Schooling

Dear Friends,

Nice issue with restoration again. Kudos to all. Our undergraduate program in environmental studies at United States International University (www.usiu.edu/academics/es.htm) includes restoration as a possible focus. Most of our students get the chance to get paid working on our large restoration program. The advantage of having students from around eighty countries is that restoration is also about making

living conditions better for people—not just for beauty and biodiversity.

Cheers,
David Bainbridge
www.ecocomposite.org

Donella Is Missed

Dear Peter Warshall:

#104, Spring 2001, just reached me here in Honolulu. I was enjoying it as always, doing fine through Pete Seeger and restoration, till I came to pages 38–39 and saw Donella's name and face and in the next five seconds realized that she had died. A real shock, a real sense of loss.

I have been a subscriber since *CQ* 1. I have the complete file, catalogs and all. (Curiosa: For a time in the early *CQ* days, when I was working back in Australia, I was the solitary subscriber on that continent.)

In Hawaii, the other place where I have lived (since the fifties), coming up to First Earth Day I turned into a crazed amateur environmentalist.

The organization (actually disorganization) I worked with from 1970 on was called Life of the Land (LoL). We researched, lobbied, litigated, demonstrated, laid down in front of bulldozers, all those good things; and we actually got maximal bang locally for minimal to no bucks. Not that we won them all, or even most—but at least a few, and I think it can be fairly said that we taught local newspapers how to spell "environment" and state legislators how to pronounce it and even respond to it .

When *Limits to Growth* came out, I started talking about it to anyone who would listen around town, and we somehow found money to bring the Meadowses out here to speak with authority. Then the next year, I somehow found money to go to Dartmouth and take a summer institute with them on systems. Those were the only two times I was around Donella, but she is one of those people who left a permanent imprint on me. So smart, so willing to think hard about dreadful things, and at the same time so fundamentally sweet a human being: a combination of characteristics not often incarnated in a single twentieth-century person.

She turned me on to one of her favorite publications, *Manas*, and we wrote back and forth for quite a while. Then, as is the way of things, we didn't write so much, then not at all. But I never felt like I had lost contact with her. I didn't have any great expectation that we might ever meet again; but I did have the expectation that if we ever happened to turn up in the same zipcode at the same time, we could pick up on our conversation again in mid-sentence. And now that's not going to happen.

A great sadness for me.

So it goes.

What is there to do but to remember her for her smartness and sweetness?—and to keep on truckin'....

All best wishes to you in life and work,
Gavan Daws
[by email]

Zafus R Us

Dear Friends,

I've just returned from my travels
to find the WER *in my mailbox.*
Tired but still energized from those
nine ancient spiritual centers, I raised
my curtains and sat down to review
my Review *and then at the end among*
the chills (I wondered if I was catching
a cold)
and the tears (who was dying, or better,
what was born), sitting back, looking out,
I thought, '...nine, yes nine that was an
important number...' (I chose a spot inside
each
site to just sit and feel) '...nine on a
menorra...
but this must be the tenth, or just a close
cousin.'
So I took my copy out to my garden and sat
on it.
Yep...the same feeling.

Thanks,
David Burgess
Parma, Italy

Kevin Kelly and John Boylan on Revolution:

Kevin says: First thanks for your compliments about the general goodness of the issue ("Letters," *Whole Earth*, Spring 2001.)

You say: *Tools are not revolution.*

I simply beg to differ. Most of the revolutions in the past three centuries have been ignited by tools and technology. The Protestant Revolution was fueled by the invention of printing. Even the French and American were enabled by newspapers, ship travel, the spread of scientific and technical knowledge. The fascist revolutions were powered by broadcast and propaganda-making technology. Even revolutions in art, like impressionism, were made possible by cheap paints. I don't necessarily think you'll agree with this view, but the point of headlines is not to write things that everyone agrees on. It's to push the viewpoint. Previous *Whole Earth* headlines like "Computers as Poison" or "Environmentalists as Problem" were similar....

John: Certainly tools contain the potential to bring about major social change. Fire did, paper did; ocean-going ships did; blast furnaces did. Today, email is a wonderful agent for change, in some ways more powerful than the web or the newer instant messaging. But the power of a technology to induce change must be seen in terms of its place in a larger social structure. A newspaper is not revolutionary without a literacy campaign.

My dictionary calls revolution a shift, albeit a radical shift, from one power center to another. For a human revolution to be truly revolutionary, it must involve growth in human spirit, in understanding and insight, in life. It must discard, or at least defang, old fears and prejudices. Revolution comes from the heart, and if Che Guevara is to be believed, a heart informed by love.

I think that an excellent example of the second sort of revolution, my revolutionary revolution, is the American Civil Rights Movement of the 1950s and 1960s...I say that the movement was a revolution because it made black people visible in this country, an unavoidable presence to the rest of the country, for the first time. Further, it finally destroyed a system that had preserved the conditions of de facto, if not de jure, slavery for a century after the Emancipation Proclamation. And lastly, it revealed the possibility of political success for the ostensibly powerless; it revealed that radical political growth could be effected through sustained effort....

My description of this revolution is relevant here in the role that technology played. Certainly tools had a role,

especially television, airplanes, telephones, Lester Maddox's [axe handles], and J. Edgar Hoover's listening devices. But these were not central to the movement itself, which relied much more on bravery, spirit, discipline, faith, and simply putting one's body on the line than it did on getting onto the nightly news. Technology aided the revolution, but tools were not the revolution.

Best regards,
John Boylan
Seattle, WA

Wholeearth.com

God bless you for putting all that stuff online. (I just had a flock of thirty redwings land in my frozen backyard.) Will you be putting on even older reviews/articles? Have been a subscriber since *CQ* No. 4. My first copy read belonged to Bucky Fuller.

Thanks,
J Pat Valentik
By email

Great issue (Winter 2000). Most useful one in years. I would love to have access to reviews of documentaries. If you find or develop a site, let me know.

Richard T.
By email

First, THANK YOU for your efforts with (Winter 2000) *Whole Earth*. It's the best I've read in a long while (been a subscriber since early '80s)! I'll tell you, if you wanted to do a website extending the TOOLS theme on an ongoing basis, I'd pay for access. Suggestion: Stick blurb in next *WE* referring interested readers to simple beta site, with a short survey asking if visitors might be willing to pay $20/yr for access. You might get enough interest to make it worth your while.

Thanks, and keep up your good works!

Alan Perla
Topanga, CA

[We are looking for funding to put all past issues, or at least major selections from old issues, online. Some technical/cost problems because of tiny type, washed-out images and yellowed paper, and permissions/copyright questions around authors we've lost contact with. We're also looking for ways to fund a "showcase" of best Whole Earth tools. Maybe within another site or leasing our material. —*Ed.*]

Whippersnappers, Meet the Old Farts

Whole Folks,

Here's my renewal check you young whippersnappers. I was contemplating letting the subscription run out. I have subscribed since the first year of *Coevolution Quarterly*. I used to read cover to cover, lately, I don't know...the style's the same, but I just can't relate somehow. The winter issue perked me up though and I found reviews, photos, and articles that made me curious.

How many of us old farts are still with you guys?

What is happening with the old communes? I know West Wind and Twin Oaks are still functioning. Are they flophouses for shiftless young people? Have they stabilized in population? Are their long-term members dying there? Has their vision shifted?

What is up with New Alchemy Institute and Ocean Arks? Are there new groups doing that kind of work?

What is the latest in sustainable architecture? Sustainable agriculture?

I no longer want to join a commune, but surely somewhere there are people striving with fresh optimistic visions that are not tied only to the latest technologies.

Sincerely,
Bob Pulley
Columbus, IN

UPDATES

In the wake of your Fall 2000 issue we would like to inform your readers of a global initiative to celebrate biodiversity—The International Biodiversity Observation Year, 2001–2002 (IBOY). The IBOY is an initiative of DIVERSITAS, the international program of biodiversity science, in which scientists and educators from over 111 countries are reaching out to make their findings about biodiversity and its linkages with society better known. The projects under the IBOY umbrella will provide new information that is urgently needed by societies, including what and where biodiversity exists, how it is changing, what goods and services biodiversity provides, and how we can conserve it. Please join us in the IBOY as we celebrate the importance of biodiversity! More information can be found at www.nrel.colostate.edu/IBOY.

Sincerely,
Diana H. Wall
Chair, DIVERSITAS International Biodiversity Observation Year 2001–2002

CORRECTIONS

Gremlins crept into the offices during production of the Spring 2001 issue and caused several mistakes, for which we apologize.

During editing, two paragraphs mysteriously disappeared from Seth Zuckerman's "Nice Boulders, but Where's the Fish" [page 71]. The last three paragraphs should read:

As we try to coax salmon runs back to abundance, our greatest teachers and allies are the salmon themselves. From time immemorial, they thrived in a landscape marked as much by disturbance as stability. Unlike the stereotype of salmon returning unerringly to their natal streams, salmon are innately resilient and opportunistic. After Mt. St. Helens erupted in 1980 and filled the Cowlitz River with ash, salmon swimming up the Columbia to the mouth of the Cowlitz smelled trouble and swam right on by, to other, undamaged tributaries. When glaciers receded from Puget Sound thousands of years ago, salmon strayed into previously ice-locked fjords and colonized newly exposed rivers. Indeed, those salmon runs helped to rebuild the soils of barren glacier-scraped landscapes with the nutrient bounty of their carcasses.

These adaptations require healthy habitat to help the fish withstand the disturbance du jour. Without big trees downstream, the Knowles Creek debris torrent would have been an unmitigated disaster. So it is up to us to protect areas that are still intact and to set the stage for watershed healing. That means addressing the sources of human-caused erosion—such as failing roads and culverts—knowing

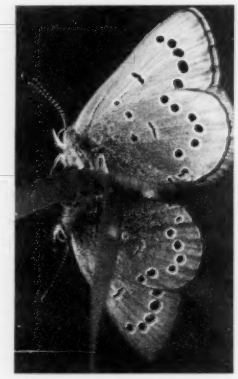
that we may not live to see the results translate into abundant salmon runs. And it calls for dogged vigilance to make sure those intact areas, which Dewberry calls anchor habitats, are not trashed. It calls for us to become attentive to what salmon are telling us—by the places they congregate and spawn successfully, the places they avoid, the seasons when they thrive and those when they decline.

For restoration to succeed, we need to recreate the context for salmon to inhabit, to have the humility to heed what they are showing us, and to find the patience for the results to manifest. Then the salmon can work their magic—on their own populations, on the landscape, and on us.

The correct address for Dan Dagget and Eco*Results!* [page 59] is PO Box 23713, Flagstaff, AZ 86002.

Geoff Millar, whom we identified as the editor of *Sing Out!* [page 23] is the managing editor. The editor is Mark D. Moss.

We should have noted that Robert Michael Pyle's essay, "Resurrection Ecology: Bring Back the Xerces Blue!" [page 68] was excerpted with the author's permission from a longer piece by the same name in the Fall 1999 issue of *Wild Earth* (www.wild-earth.org).



Robert Stewart,
Common Butterflies of California

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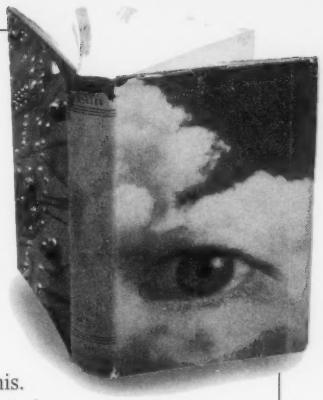

Peter:

At the close of your editorial in the Winter 2000 issue, you suggested that "Megabooks" were contributing to *Whole Earth*'s circulation woes.

I got two grins out of this.

Grin one: "Megabooks" is the name of a brave little indie bookstore in downtown Palo Alto. It must have what it takes, despite having no room for a coffee shop or reading room, because it's managed to survive two or three doors down from the Palo Alto branch of Borders.

Grin two: I purchased that issue of *Whole Earth* from a Barnes & Noble superstore in San Mateo. A fair number of big-chain bookstores carry *Whole Earth.*

Which leads me to something that must be said: While I have no doubt that the megachains pose a serious threat to lovingly run, knowledgeably staffed independent bookstores, I cannot help but think that in most parts of the country, the megachains are the best thing that's ever happened.

These places have never had lovingly run, knowledgeably staffed independent bookstores!

The habitat of the indie bookstores threatened by the chains is college towns and cosmopolitan cities. Outside of these lucky places, you would be fortunate (before the advent of the megachains) to be near one of the mall-based storefront outlets, such as B. Dalton or Crown. You'd probably have to settle for a few racks of paperbacks at the back of a variety store, and a magazine rack full of fashion and racing magazines.

I grew up in a very wealthy part of Long Island, New York. You might think that boutique-filled Locust Valley, home to millionaires and two private schools, would have a decent bookshop. The two bookstores it did have were a rare & antiquarian bookshop (run by a crabby old fellow who didn't care for kids and teens) and a boutique that called itself a bookstore but was really a gift shop. I had to ride a bus or cadge a ride to Hicksville, a half-hour away, to find even a "mall" bookstore.

I was fortunate to live close to a good public library, and to be a train ride from New York City and its abundant shops. But even then, I was utterly thrilled when Barnes & Noble opened up a megastore on Long Island.

Best,
Stefan E. Jones
Foster City, CA

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Mead always believed in the human capacity to change, insisting that the cultural habits of racism, warfare, and environmental exploitation are learned. She promoted human diversity as a teaching tool; pointed to modified traditions and new institutions that had successfully adapted to a changing world; and praised groups who were inspirations, models, and vehicles for learning from one another. Her goal was nothing less than intercultural and international understanding as a foundation for human freedoms.

If you know of a small group (fewer than 100 people) anywhere on the planet that has worked to change the world; that has cross-connected issues such as race, environment, intergenerational learning, child rearing, and gender understanding; that has developed an organization or series of tools that others can learn from; and that takes a long view of cultural understanding, please send your nominations to:

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Anonymous, Phil Barney, Alain Coupal, Douglas Dolstad, Chris Gilbert, Oliver Hargreave, Darrell Hunt, Island Weddings, Arno Kahn, Thomas Keck, James Kisela, Sergei Kucherov, James Kulp, John Larson, the Marin Community Foundation, Gordon Moore, Alan Ransenberg, Wynn Rees, Roger & Carrie Ringer, Peter Roberts, Gary Seelig, C. Serrao, Bruce Sterling, Anne and Robert Stowell, Susan Tauck, Terry Lee Weeks, and Michael Wilson.

Thanks to Kevin Kelly for almost single-handedly getting me into this mess. A big "Thanks for all the fish" to Douglas Adams. —*Bruce Sterling*

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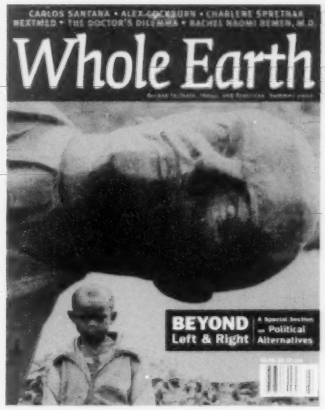
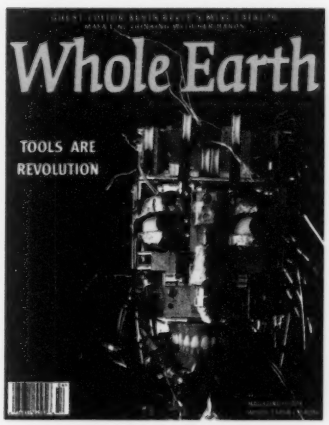
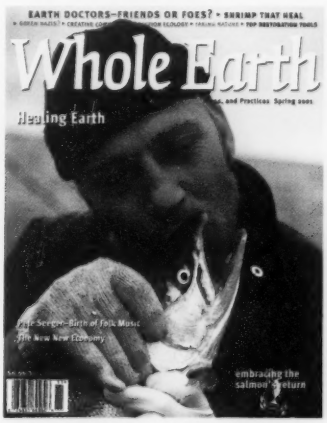


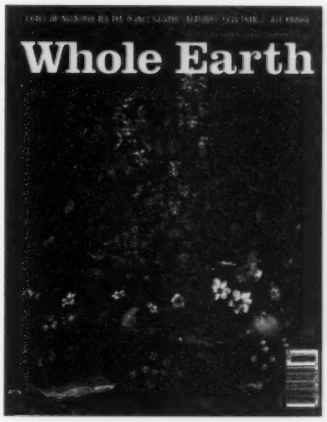
#101. Summer 2000 — Beyond Left & Right: An unorthodox look at the political spectrum. Is it obsolete? Leftists, rightists, libertarians, and greens look for issues on which to agree and disagree. Do we live within a media-generated Matrix? An inside account of radical politics and the civil rights movement. Also in the issue: "Next Med": the not-so-comforting future of medicine. $12 postpaid.



#103. Winter 2000 — Tools Are Revolution: A celebration of Kevin Kelly's (and friends') current favorites, with *Whole Earth Catalog*-style reviews of nearly 200 books, tools, documentary videos, "really useful websites," books on tape, and more. It's intensely personal and not afraid to be controversial. Also: Maya Lin, creator of the Vietnam War Memorial, on landscapes, history, and making mindful art. $12 postpaid.



#104. Spring 2001 — Healing Earth: The state of ecological restoration today—success stories (from saving shrimp to saving watersheds, cows as restoration allies, "resurrection ecology"), new resources and tools for restorationists, controversies (faking nature, "Green Nazis") arising as restoration becomes more sophisticated and complex. Also: interview with Pete Seeger, the "New, New Economy," reviews of fine catalogs. $12 postpaid.



#102. Fall 2000 — All Species Inventory: Only 5% of Earth's species have been described. This is the first and only magazine to promote an all species inventory. How to discover the 10 to 100 million unknown species? To utilize "barefoot taxonomists"? To combine natural history with digital technology? Which groups need most attention? E.O. Wilson, Miriam Rothschild, Stephen Jay Gould, Lynn Margulis, Vladimir Nabokov, Stewart Brand, Kevin Kelly, David Quammen. Also: the nontourist Hawai'i, with bioregional photos and access. $ 12 postpaid.

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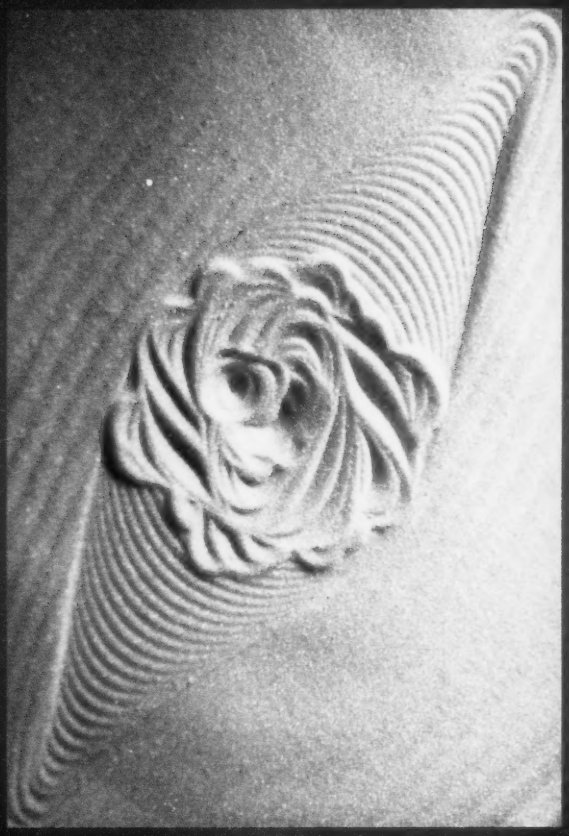

Sandpainting – Artist: Gaia
Made by a pendulum on sand during the 2001 Seattle earthquake.
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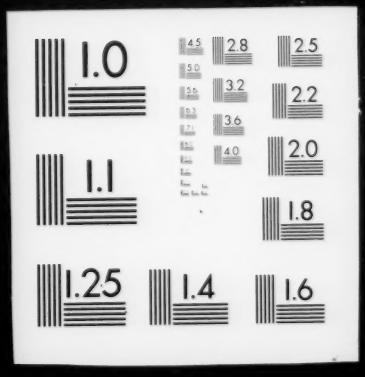
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